

An examination of the use of two methods of screening tools in learning disability services

Donna Paxton

Trainee Clinical Psychologist

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Declaration of own work

“I declare that I am the sole author of this thesis and that the work contained herein is my own. This thesis, or any part of it, has not been submitted for any other degree or professional qualification”

Donna Paxton

1.8.05

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Abstract

Rationale: The increasing need for clinical psychology services has led to the use of screening tools, particularly in specialties where there are limited resources. The present study explores the use of two screening tools in learning disability services. The first part of the study examines the ability of a new screening tool, the Learning Disability Screening Questionnaire, to discriminate between individuals with a learning disability and those who do not have a learning disability. The second part of the study explored the ability of the two and four subtests of the Wechsler Adult Intelligence Scale- Third Edition (WAIS –III) which correspond to the parallel subtests of the Wechsler Abbreviated Scale of Intelligence (WASI) to discriminate between both groups.

Method: An examination of case files from a learning disability psychology service in a rural area of Scotland was undertaken. There were 160 participants included in part one of the study and 275 in part two. Information was gathered regarding individual's subtest scores on the Wechsler Adult Intelligence Scale- Third Edition (WAIS-III) and the items included in the screening tool.

Results: The Learning Disability Screening Questionnaire achieved several measures of reliability and validity. A logistic regression was carried out on both forms of screening tools and found that the two subtest parallel short form of the WASI correctly predicted 66.2% of group membership; whilst the four subtest parallel short form of the WASI correctly predicted 82.7% of group membership. The Learning

Disability Screening Questionnaire correctly predicted 89.3% of group membership. Implications for clinical practice for both forms of screening tools are discussed in detail.

Overview of thesis

The term 'learning disability' is a social construct, the defining characteristics of which have changed throughout the years as a result of political and social influences. Similarly, service provision has also had to respond to these influences. As clinical psychologists our roles within learning disability services has historically included one of assessment. The development of intelligence testing, initially used as a scientific means of discriminating those who would benefit from special education, has shaped the role of psychologists within learning disability services. Many individuals referred to the service have to undertake an intellectual assessment as a means of ascertaining whether they meet the diagnostic criteria of learning disability. The increasing demand on limited health resources have placed psychologists in a gate-keeping role, ensuring that clients admitted to the service meet the criteria for learning disability services. Services have had to explore valid ways of determining the needs of this client group.

This thesis will examine two alternative ways of identifying whether individuals meet the current criteria for a learning disability. It is acknowledged from the start that the thesis is shaped by two potentially conflicting factors: the first is the belief, now explicit in many recent policy documents, that service provision should be shaped by need rather than strict adherence to criteria. The second, more pragmatic viewpoint is influenced by increasing clinical pressure on learning disability services to use scarce resources in the best way possible. The former stance leads to a broadening of criteria for accessing services, whereas the latter leads to a stricter adherence to learning disability criteria. This tension will be apparent throughout the

thesis. To place it in context, the introduction to the thesis will be structured as follows: the first section will provide an overview of the history of learning disability services, showing how this has changed according to how the idea of 'learning disability' has been socially constructed over time.

The next section will look at the role that intellectual assessment has played in determining access to learning disability services. Intellectual functioning has always been the distinguishing factor by which to identify those with a learning disability. Throughout time much emphasis has been placed upon intellectual ability as a measure of a person's potential to contribute to society. Prior to the development of theoretically driven, standardised assessments, crude measures of intellectual ability were used as a means of measuring whether an individual was '*non compos mentis*.' Intellectual assessment is, an important factor in the delivery of services. Knowledge of a client's cognitive abilities informs others of the strengths and difficulties the client has and can instruct care staff of the best way to work with him/her. The use of intellectual assessment has been consistently used as a means of provisioning and rationing services.

The concept of adaptive behaviour, another key concept in the definition of learning disability, will be introduced, with a discussion of how this has been measured and assessed over the years. The following section will look at service provision today and the conflicting pressures that clinicians working within learning disability services are under and how the outcome of this has been the development of screening tools. Finally, the introduction will outline the rationale for the study.

1. Introduction

1.1. History of learning disability services

The following section will outline the history of service provision for people with a learning disability. Where necessary, the terminology used to describe what we now call 'learning disability' will correspond to that used during the historical time period being discussed.

From the Middle Ages to the 17th century, beliefs about the causes of mental incapacity were dominated by demonology. It was thought that those who were inflicted by mental illness or mental handicap were under the influence of witchcraft. Individuals deemed as being demonised became the responsibility of the local priests, who delivered treatment in the form of exorcism or persecution (Neugebauer, 1996).

During this time the administrative affairs of the person with a learning disability were exercised through the Court of Chancery, which dealt in the jurisdiction of equity of land and property. A 13th century government act, 'Prerogativa Regis,' decreed 'Idiots' and 'Fools' as people who were legally incompetent and therefore, unable to govern their own affairs (Neugebauer, 1996). This act gave the government the right to take control of the property and land of those who met these criteria. A later amendment of 'Prerogativa Regis' also allowed for local officials to also take custody of the person.

The distinction between 'Idiocy' and 'Fool' saw the beginnings of defining those with a learning disability. A 'Fool' was defined as:

"An individual of retarded development whose mental capacities never progressed beyond that of a child" (Neugebauer, cited in Wright and Digby, 1996, page 25).

This definition would include those who became brain damaged as a result of accidents or illness, whereas an 'Idiot' or 'Natural Fool' was someone with a congenital disability who had a permanent disability (Neugebauer, 1996). There remains some similarity with these diagnostic criteria and the current defining criteria for learning disability, which includes the concept of global developmental delay.

Assessment of 'Idiots' and 'Fools' was carried out by court officials, who, in front of a jury, would attempt to ascertain the cognitive and adaptive functioning of the individual (Neugebauer, 1996). The assessment was based on the individuals' ability to function in everyday life and their ability to care for themselves. Questions would typically include basic arithmetic, coin recognition, their ability to identify the age and name of their parents and if they could keep an orderly house (Neugebauer, 1996). Once a 'diagnosis' had been given, an unrelated individual could take guardianship of the individual by taking out an 'Idiot Grant' which enabled them to take control of the individuals property and land in exchange for protecting and providing board for the person. This system of 'service provision' ended in 1540 when Courts of Wards were set up to provide orphaned children protection from exploitation and also included those with a learning disability (Neugebauer, 1996).

During the Victorian era support for people with a learning disability was accessed via poor law administrators, who would be approached by families for financial help (Andrews, 1996; Rushton, 1996). The decision to provide support was often done on an ad hoc basis (Andrews, 1996). The parish advocated that the responsibility to support the person with a learning disability belonged to the family and therefore, if the family had property it would be sold to pay for the care required. Likewise, if there were extended family with means the responsibility would fall upon them. Very few individuals were admitted to asylums as they were expensive to run and as such only the very unmanageable would be sent there (Andrews, 1996). The majority of people with a learning disability, therefore, remained at home and poor law relief would be available for a limited time to provide basic essentials or to support children through infancy. Often relief was requested for support following the death or illness of a family member. Parish 'nurses' or 'keepers' would be employed to provide the care required at this time and give the family some respite (Andrews, 1996). Individual's abandoned by their families would stay with the keepers on a longer-term basis. If they were able to work their income would go back into the parish.

Further additions to 'Prerogativa Regis' made a distinction between 'Idiocy' and 'Lunacy'. 'Lunacy' was seen as acquired and punctuated with periods of 'lucid intervals', whereas 'Idiocy' was classified as being 'congenital and irreversible' (Andrews, 1996; Neugebauer, 1996; Rushton, 1996). The need for defining those with a learning disability was of great importance at this time. The difference

between 'Lunacy' and 'Idiocy' had legal implications in that those defined as 'lunatics' were afforded more rights (Neugebauer, 1996). As treatment was time limited, they did not lose claim to their properties and land once they were cured.

The industrialisation movement of the Victorian era created a demand for an educated workforce. As families moved to urban areas, people with learning disabilities became more visible, as did their perceived lack of a valuable contribution to society (Caine, Hatton & Emerson, 1998). The late 19th century saw education become compulsory for all children and children would attend Sunday schools or have lessons at home. Poor educational performance identified those who could not offer much to the workforce and consequently they became a social problem. The social reforms of this time demanded that something be done to address this problem and as a result the term 'idiocy' now included those who were deemed ineducable. The assessment process for this heavily relied on anecdotal evidence from the family about the child's ability to learn and retain information (Wright, 1996). The family, concerned that the child was not learning, would consult a doctor, who would ask the child basic numeracy or literacy questions. This in addition with the family information would allow the doctor to diagnose the child as an 'Idiot' and a 'Certificate of Insanity' would be administered (Wright, 1996). Institutions were established to separate those who could not learn and children were admitted for the purpose of training them to contribute to society and a 'Certificate of Insanity' was required for admission (Gladstone, 1996).

Towards the end of the nineteenth century the medical profession became more involved in the care of people with learning disability and began to conceptualise 'idiocy' as an organic condition with no cure (Wright, 1996). During the period between the late 19th century and the early 20th century doctors began to portray themselves as 'experts' in the field of mental deficiency and began publishing articles on the causes. For example, John Langdon Down put together the characteristics of 'mongolism' and changed the name to 'Down Syndrome' (Digby, 1996).

About the same time the eugenics movement postulated that problems with society could be attributed to people of inferior genetic stock and as a result 'idiots' should not be allowed to have children (Caine et al. 1998). The influence of the Eugenics movement led to the segregation of those with a learning disability and demands for sterilisation of 'mental defectives' (Digby, 1998) These theoretical perspectives directed a move towards institutions segregating people with a learning disability as a means of protecting them from society and protecting society from them (Jackson, 1996).

This period in time also saw psychologists develop the theory of unified intelligence and propose a scientific means of identifying those who were 'mentally deficient' (Digby, 1996). This definition incorporated those defined as 'idiots', 'imbeciles' and 'feeble-minded'. The terms 'imbecile' and 'feeble-minded' are distinguished from 'idiot'. An 'imbecile' was assumed to have greater reasoning ability than an 'idiot',

whilst the 'feeble-minded' individual was seen as having a permanent, hereditary condition (Andrews, 1996).

The assessment of these conditions, however, had not changed from previous assessment measures. The same types of questions would be asked and as a result of the lack of valid assessment methods, the terms were often used interchangeably (Andrews, 1996). There was an increase in the number of people diagnosed as 'mentally deficient' as this term could be used to incorporate those who created difficulty within their society such as 'delinquents' and 'degenerates' (Cox, 1996). The Mental Deficiency Act of 1913 subsequently saw an increase in those requiring institutional care and was used to detain those who were 'morally deficient,' typically, young women who had children out of wedlock (Gladstone, 1996).

Institutions became the responsibility of the welfare state following the establishment of the National Health Service in 1948. Institutions then became hospitals and those living in them became patients. This led to the medical model becoming the predominant model of service provision and care for people with a learning disability and remained so until the introduction of the Community Care Act in 1990. The 1960's saw a shift in the view that people with learning disabilities were a threat to society. The civil rights movement, which was extended to people with learning disabilities, petitioned that the person with a learning disability be afforded the same rights as the rest of society (Caine et al. 1998). With the interests of people with a learning disability now on the political agenda, further moves to close hospitals were

campaigns following a series of scandals that highlighted neglect to those who resided in them (Race, 1995).

The White Paper, 'Better Services for the Mentally Handicapped' proposed an increase in community- based services' (DHSS, 1971) and this saw the start of people moving out of institutions and into large group homes. This continued throughout the 1980's and the principles of Normalisation (Wolfensberger, 1972), which advocated that people with learning disabilities have the opportunity to live the same patterns of life that is afforded to the rest of society, shaped the way that future services were delivered. During the 1980's the work of Tyne and O'Brien (1981) was utilised to evaluate human services. Their proposed 'Five Accomplishments' are considered necessary for the provision of high quality services and include the following:

- Choice: The service user should, as much as they are able, be supported in making informed choices about their life.
- Community Presence: The service should ensure that the individual is given opportunities to integrate with the community.
- Competence: The individual should be supported in acquiring competence in the skills and attributes needed for community living.
- Respect: The service will promote respectful treatment practices to the individual and wider client group.

- Relationships: The service will promote and encourage the formation of new friendships and relationships.

The principles of normalisation have prompted a radical shift in the care of people with a learning disability. Further discussion about current service provision and the social, political and philosophical influences underpinning it will be discussed in the final section of the introduction.

1.1.1. Defining Learning Disability

As was outlined above, the terminology used to describe what we now call ‘learning disability’ has changed considerably over the years and has been influenced by a number of social factors. In Britain, the term ‘learning disability’ replaced the term ‘mental handicap’ in the late 1980’s, however, many clients, professionals and members of the general public use the term ‘learning difficulty’. The terminology used in other countries include, intellectual disability and mental retardation. The changes and differences in terminology can, however, cause some confusion as learning disability services may receive referrals for people with specific learning difficulties, such as dyslexia. A study by McKenzie et al. (1999) reports that the changes in terminology and service provision may have contributed to the lack of understanding in many staff about the defining characteristics of learning disability. Despite the fact that the terms used may cause confusion, the defining criteria has

remained relatively stable over time, in that the definition has always included impairment of cognitive and adaptive functioning.

The current and most widely used definition of learning disability is as follows:

- Significantly sub-average general intellectual functioning, that is an IQ of about 70 or below. That is accompanied by:
- Significant limitations in adaptive functioning in at least two of the following skill areas: communication, self-care, home living, social / interpersonal skills, use of community resources, self-direction, functional academic skills, work, leisure, health and safety.
- The onset must occur before age 18 years

American Psychiatric Association (2000).

Other definitions currently in use include those of the American Association of Mental Retardation, (AAMR), (2002) and the British Psychological Society, (BPS) (2001). These are as follows:

1.1.2. The AAMR Definition of Mental Retardation

Mental Retardation is a disability characterized by significant limitations, both in intellectual functioning and in adaptive behaviour as expressed as conceptual, social and practical adaptive skills. This disability originates before age 18. There are five assumptions essential to the application of the definition:

1. Limitations in present functioning must be considered within the context of community environments typical of the individual's age peers and culture.
2. Valid assessment considers cultural and linguistic diversity as well as differences in communication, sensory, motor, and behavioural factors.
3. Within an individual, limitations often coexist with strengths.
4. An important purpose of describing limitations is to develop a profile of needed supports.
5. With appropriate personalized supports over a sustained period, the life functioning of the person with mental retardation generally will improve.

American Association on Mental Retardation (2002).

1.1.3. The British Psychological Society definition of learning disability

The British Psychological Society's position on the definition of learning disability is as follows:

“Irrespective of the precise terminology, or the wording in the various definitions, there are three core criteria for learning disability”:

- Significant impairment of intellectual functioning;
- Significant impairment of adaptive/ social functioning;
- Age of onset before adulthood.

British Psychological Society (2001, page 4).

All of the above definitions highlight that the individual must meet all three, core criteria before being considered as having a learning disability. In order to diagnose learning disability, it is necessary to carry out an individually administered, standardised assessment of intelligence (BPS, 2001) as well as an assessment of adaptive functioning. The clinician then must also try to determine whether any of these impairments occurred in childhood (Murray, McKenzie & Lindsay, 2003).

As illustrated above, the definition of learning disability, how it is assessed and the way services have been provided has changed over time. The defining criterion of learning disability has, however, remained relatively stable since the 13th century. The assessment methods then were based on questions thought to be of common sense and culturally relevant to that time. One of the biggest changes is the change in terminology used to define people with a learning disability. Terms such as, 'Idiot' and 'Fool' are regarded as pejorative in today's society and have negative connotations to the people they are used against. Professionals currently working in learning disability services propose that there is a further change to current terminology as it can be misleading and confusing. Discussion of this and of current service provision, examining the impact this has on psychology services, will be further explored in a later section.

The following section will examine the role of intellectual assessment in learning disability services and how this is crucial to the diagnosis of individuals.

The notion of intelligence and what defines it has always caused debate amongst psychologists (Gross, 1996; Roth, 1990). The history of intelligence has focussed upon the individual differences between people (MacKintosh, 1998). Francis Galton was the first psychologist to systematically examine these differences (Roth, 1990). His theory of intelligence in 1869 was based on the premise that individual differences in intellect were due to hereditary factors. Galton's research was driven by the nature / nurture debate at that time. He strongly believed that eminence breeds eminence and set about testing this hypothesis by measuring sensory acuity and reaction time, as he believed that the more perceptive a person was, the greater their intelligence (MacKintosh, 1998). Galton's study of intelligence was set in the social and political time when there was a move to segregate people with a learning disability in order to prevent them having children and protect them from wider society. As the founder of the Eugenics movement, Galton's findings had a great influence upon the lives of people with a learning disability.

Galton's study of individual differences in intelligence triggered further research in this area and by the 1920's, psychologists had come up with several definitions of intelligence (Roth, 1990). The statistical technique of correlation gave psychologists the means to measure the strength of association between two or more factors (MacKintosh, 1998).

Psychologist Charles Spearman used the technique of factor analysis to measure the correlation between children's performance on different academic tests. He observed that all of the tests measured both general and specific factors. He proposed that they must have, therefore, been tapping into a basic mental ability and suggested that every intellectual activity has a general factor, also known as *g*, or general intelligence, and a specific factor, *s*, (Gross, 1996). Spearman believed that when two tests are highly correlated this was attributable to *g* and when there is a lesser correlation, the test is measuring a specific ability (MacKintosh, 1998).

American psychologist, Louis Thurstone, argued that not all mental tests correlate equally. He believed that, although some mental tests have equal correlation, there is a cluster of seven distinct primary mental abilities. These include, numerical reasoning, word fluency, memory, perceptual speed, verbal meaning, spatial perception and reasoning (Roth, 1990). Thurstone proposed that intelligence was not a general factor, and if a person performed well in one of these areas this did not necessarily mean that they would perform well at another (Roth, 1990).

Further research into the concept of intelligence appears to support the notion of the *g* factor. Burt and Vernon expanded Spearman's two- factor model and identified major and minor group factors in between *g* and *s* (Gross, 1996). They proposed a hierarchy model where *g* is an accumulation of all the tests given. Major group factors include overall verbal and spatial ability, whilst the minor group factors are

the particular tests in each of these areas and specific factors relate to each individual test on its own.

Horn and Cattell (1967) added that the *g* factor can be divided into fluid and crystallised intelligence. They suggested that fluid intelligence (*gf*) is the ability to solve abstract problems and deal with new information. Fluid intelligence is free of cultural or educational influence, whereas crystallised intelligence (*gc*) reflects the previous learning of the individual and taps into the knowledge acquired from education and life experience. This is an important factor that needs to be considered when assessing the intellectual functioning of people with a learning disability, as they can be disadvantaged in subtests that are measuring crystallised intelligence or reflect educational attainment.

The concept of intelligence continues to cause debate amongst psychologists (Gross, 1996). Sternberg, Conway and Bernstein (1981) conducted a study asking experts and non-experts to rate behaviours characteristic with intelligence. Both groups identified verbal intelligence, problem solving and practical intelligence as major factors. Sternberg (1990) argues that intelligence is more than just a set of information processing components and believes that the individual's culture and how he/she adapt to their environment shows evidence of intelligent behaviour. Current intellectual assessments do not measure all aspects of intelligence such as dealing with novel situations or emotional intelligence (Gross, 1996). Intellectual assessment and how it relates to people with a learning disability is discussed below.

1.2.1. Intellectual Assessment

Galton's methods of measuring intelligence, discussed above, were later abandoned following American psychologist, Clark Wissler's, findings that sensory motor tests did not correlate with intelligence (Roth, 1990). Further advances in intelligence testing occurred as result of pragmatic need. In 1905, Binet and Simon developed intelligence testing as a means of identifying children for whom special schooling would be beneficial. Their 'Measuring Scale of Intelligence' focussed on the child's use of everyday practical knowledge and skills. Binet and Simon's most important contribution to the development of intellectual tests was their suggestion that a child's age could be used as an independent criterion of intellectual ability (MacKintosh, 1998). They argued that a child's ability to problem solve increases with age. Their tests were aimed at finding a child's mental age and if this was below their chronological age it could be used as a measure of their intellectual functioning and determine whether the child would require special education. Stern (1912) developed a formula to calculate this and introduced the concept of the Intelligence Quotient or IQ (Eysenck, 1998).

The Binet- Simon scale was later revised by Terman in 1916 and became the Stanford- Binet test. This scale was tested on a larger population sample, giving more accurate data about children's intellectual functioning and became the standard against which all subsequent intelligence tests were judged (MacKintosh, 1998).

1.2.2. The Wechsler Adult Intelligence Tests

The Stanford-Binet test was the most widely used measure of intelligence until the development of the Wechsler tests (first published in 1939 as the Wechsler- Bellevue Scale). This test filled the gap in the market for measures of adult intelligence and was originally standardised on 1500 adults (MacKintosh, 1989). Wechsler defines intelligence as

“The aggregate of the global capacity to act purposefully, think rationally, to deal effectively with the environment”. (Wechsler (1944) as cited in Gross, (1996), page 710).

Wechsler’s theory of intelligence lies somewhere in between the stances of Spearman and Thurstone, in that he proposes that there is some commonality between behaviours indicative of intelligence as well as other salient factors besides *g* (MacKintosh, 1989).

The Wechsler tests were first revised in 1955 to become the Wechsler Adult Intelligence Scale (WAIS) (Wechsler, 1955) and again in 1981 to become the Wechsler Adult Intelligence Scale- Revised (WAIS- R) (Wechsler, 1981). The most recent updated version, which was published in 1997, is the Wechsler Adult Intelligence Scale- Third Edition (WAIS -III) (Wechsler, 1997). Wechsler has also developed a version suitable for children, of which the Wechsler Intelligence Scales for Children- Fourth Edition (WISC-IV) (Wechsler, 2003) is the most recent.

The Wechsler tests contain 14 subtests, which contribute to index scores and give a full scale IQ. The index scores measure the following:

1. Verbal comprehension: This measures the individual's ability to work with abstract symbols, verbal fluency, verbal memory abilities and the degree to which they have benefited from education.
2. Perceptual organisation index: This measures an individual's ability to integrate perceptual stimuli with appropriate motor responses, work in concrete situations, have appropriate contact with the environment and evaluate visuospatial information.
3. Working memory index: This measures the individual's attention and ability to hold and manipulate new information.
4. Processing speed index: This measures the speed at which the individual processes new information.

Wechsler Adult Intelligence Scale - Third Edition (1997).

The scales do not use the concept of mental age as used by Binet and Simon but instead measures intelligence by means of a 'deviation IQ', which informs the tester of how many standard deviations from the mean of the testee's age group the person's score lies (Gross, 1996). From this Wechsler used the concept of normal distribution, which gives an indication of the individual's score in comparison to the rest of the tested population of the same age.

The WAIS-III (Wechsler, 1997) is said to have some of the best psychometric properties in the domain of intelligence testing (Groth- Marnat, 2000) and has been extensively researched in terms of validity and reliability (Lezak et al., 2004).

1.2.3. Intellectual Assessment and people with a learning disability

The WAIS- III (Wechsler, 1997) is widely used in the diagnosis of learning disability as a means of assessing intellectual functioning. It is recommended that any assessment used to measure intellectual ability is reliable, valid and properly standardised (BPS, 2001), hence the popularity of the WAIS-III (Wechsler, 1997) with clinicians. The arbitrary convention of deciding that 2 standard deviations (1=15 points) from the mean in the diagnosis of learning disability used in this assessment, also provided the means by which different levels of learning disability were classified. The American Psychiatric Association, (2000) currently classifies four degrees of severity of learning disability in relation to the individual's measured intellect. These are:

- Mild Mental Retardation: IQ 50-55 to approximately 70.
- Moderate Retardation: IQ 35-40 to 50-55
- Severe Mental Retardation: IQ 20-25 to 35-40
- Profound Mental Retardation: IQ level below 20-25.

The British Psychological Society (BPS) recommended in 2001 that an individual's level of need should be considered in the sub- classification of the impairment of intellectual functioning. The society acknowledges the use of the Wechsler scales and recommends cut off points, with a standard deviation of 15 points, corresponding to IQ scores of <70 and <55, thereby classifying impairment of intellectual functioning as:

- Significant Impairment of Intellectual Functioning: IQ 55-69
- Severe Impairment of Intellectual Functioning: IQ <55.

British Psychological Society (2001, page 9).

The BPS (2001) also recommends that caution should be exercised when assessing an individual's intellectual ability. The tester needs to be aware of factors that may impact upon a person's performance, these include, emotional/ psychological distress, medication, alcohol or drugs and psychiatric disorder. Many of these are common within the learning disability population (World Health Organisation, 2001). The tester will need to be able to differentiate between the influence of such factors on performance and the learning disability itself. The BPS (2001), therefore, recommends that as test results are open to interpretation, non- psychologists are encouraged to seek the advice of a qualified psychologist.

The need for intellectual assessments to be carried out by a qualified psychologist or an individual supervised by a psychologist (BPS, 2001) has shaped the role of clinical psychologists in learning disability services. Clinical psychologists may, therefore, be viewed as the gatekeepers of services, as a measure of an individual's intellectual functioning is necessary to obtain a diagnosis of learning disability. The BPS (2001) however, cautions against the use of intellectual assessments solely as a means of being denied access to services.

The BPS (2002) suggests that it is good practice to give consideration to the individual's level of ability when using and interpreting the results. Similarly, the American Association of Mental Retardation (2003) highlight factors for consideration when determining whether a person has a learning disability. These include the evaluation of limitations in functioning within the context of the person's age peers and culture. It is also important to recognise the individual's strengths instead of focussing solely on their needs.

1.2.4. Limitations of intellectual assessment with people with a learning disability

There can be difficulty in maintaining reliability and validity in using the WAIS-III with people with a learning disability. When comparing the individual's functioning with their age peers, the British population sample was 332, as compared with a US sample of 2450 (Wechsler, 1997). This indicates an under representation in the standardisation norms of people with a learning disability, there are, therefore,

concerns about applying norms and the assumptions that go with this, to people from socio- economically, disadvantaged or culturally different backgrounds (Groth-Marnat, 2000).

As intelligence cannot be measured at an exact figure, the WAIS-III provides scores that fall within limits of measured ability. This standard error of measurement becomes greater the fewer test items are used. This implies that for people with a learning disability, whose norms are based on a smaller sample than the normal population, there is a greater need, to complete all of the subtests in order to achieve an accurate measure.

There are also a number of exclusion criteria that would affect people with a learning disability, for example, people with sensory difficulties. It is reported that there is a higher prevalence rate of sensory deficits in people with a learning disability as compared with the general population (Jansen et al., 2004). Burton, (1997) also highlights the lack of suitability of the items for clients functioning at the lower end of the intellectual scale, thus limiting the use of the WAIS-III further for people with a learning disability.

The BPS (2001) voice concern about the validity and reliability of currently available tests in attempting to measure the intelligence of individual's with very low intellectual functioning. The WAIS-III (Wechsler, 1997) has attempted to address

some these concerns by increasing the number of easier items within each subtest, but for many it remains difficult to achieve an accurate measure of their functioning.

The WAIS-III (Wechsler, 1997) is also criticised for the many questions that tap into crystallised abilities such as school-learned items (Kaufman & Lichtenberger, 1999). Education is a typical area where many people with a learning disability are disadvantaged. The WAIS-III (Wechsler, 1997) norms report that clients with a mild learning disability show a profile favouring Perceptual Organisation over Verbal Comprehension (Groth- Marnat, 2000). Murray et al. (2003), however, observe the general tendency for people with a learning disability to display higher verbal abilities, with some clients falling out with the range of learning disability in the Verbal IQ and Verbal Comprehension Index. Kaufman and Lichtenberger (1999) report studies where there is similar variability in the results found for people with a learning disability. They suggest, however, that some of the variability of results in American studies can be attributed to the lack of adherence to the definition of learning disability.

The documentation of the rise of IQ scores the world over has meant that IQ norms become outdated over time (Flynn, 1984, 1998). This effectively renders intelligence norms obsolete shortly after standardisation (Flynn, 1984). Once a test is re-normed the mean is reset to 100 making the test harder and hiding the previous gains (Kanaya, Scullin & Ceci, 2003). Flynn has documented the effect the IQ drift has on the population within the average range of intelligence but research has not evaluated the affect of this on the learning disability population. Flynn (2000) has, however,

noted that depending on the size of the drift at the lower end of the IQ scale, this could impact upon whether a person receives a diagnosis of learning disability and ultimately receive the services that he or she requires (Flynn, 2000).

Kanaya et al. (2003) discuss the implications of the Flynn effect upon American society and reports that a person's score on an IQ assessment can literally mean the difference between life and death for prison inmates, as it is considered 'cruel and unusual punishment' to execute people who have a learning disability. Whitaker (2003) notes that within the British learning disability population there is a risk of people being mislabelled as a consequence of the IQ drift.

Some organisations and services have allowed for the IQ gain and have changed the IQ limit for clients using the services. The American Association of Mental Retardation (2002) raised the ceiling to 75 to allow for measurement error. Evers and Hill (1999) report that services in the Netherlands have raised the upper limit of IQ to 80 - 84 in their definition of learning disability. Greenspan (1999), however, argues that the current system of classification allows people to slip through the net which means that individuals do not get their needs adequately met.

Murray and McKenzie (1999a) advise interpreting the results of the WAIS with caution as they note that there can be a difference in scores if an individual is tested close to the age of the transition points. The Wechsler manual (Wechsler, 1997) advises conforming as closely as possible to the standardised instructions. It has been observed, however, that clinicians make an increasing amount of administration

errors when carrying out the test. Slate, Jones and Murray, (1991) report that the Full Scale IQ of the client was affected by the numerous errors made by the examiners in their study. Similarly, Moon, et al. (1991) carried out a study with doctoral students, some of whom had completed a formal course in psychological testing, and found that only 67% administered the WAIS according to the instructions.

A recent study examining the way that qualified clinical psychologists administer the WAIS III to clients with a learning disability (McKenzie, Murray & Wright, 2004), found that half of the participants regularly missed out some of the subtests and 20 of the 24 participants reported that they did not follow the standardised instructions. Reasons given for this included simplifying the wording in order that the client understood the questions or that clients needed additional instructions. This clearly has implications for the validity of an assessment that is necessary for the diagnosis of learning disability. This can also have legal implications as knowledge of a client's intellectual capacity forms a central part of the assessment of informed choice (Murphy & Clare, 1997).

Many researchers are critical of the use of intellectual assessments arguing that categorising individuals is immoral as it denies the person their individuality (Gelb, 1997). Fidler and Hodapp, (1998) remind us that the results of intellectual assessment provides a small picture of the client's needs, however, the general characteristics found in groups, such as those with a learning disability, are helpful in predicting the level of support the client will need. Knowledge of an individual's

intellectual abilities is also thought to predict their level of achievement (Eysenck, 1998). Studies have shown that there is a relationship between the client's intellectual functioning and level of support required, with increased support needed for those with more severe cognitive impairments (Evans, 1991). It can also be helpful to staff supporting the client as information about the cognitive strengths and weaknesses of the client can inform the best approaches to take when working with him/her. (McKenzie & Murray, 2002)

An additional dimension has been introduced into the intellectual assessment of people with a learning disability with the development of short forms of intellectual assessments. These are discussed in more detail below.

1.3. Short- forms of Intellectual Assessments

Short-forms of intellectual assessments were developed for predominantly pragmatic reasons. The administration of intellectual assessments can be time-consuming for the clinician and stressful for clients. Crawford, Allan and Jack (1992) report that the use of short forms are necessitated by the heavy caseloads of clinicians. These factors, therefore, have led to an interest in the use of short-forms and subsequent increase in research. A study examining the utility of short forms in Australia, Canada, the United Kingdom and the United States, (Thompson et al., 2004), reported that the most frequently used short forms are derived from the Wechsler scales (Wechsler, 1981, 1997). It is, however, reported that Wechsler advocated the

use of short forms of intellectual assessment for screening purposes only and recommended where possible that a full assessment is carried out (Silverstein, 1990).

There have been a number of studies examining the use of short- forms of the Wechsler scales (Wechsler, 1981, 1997) as a means of obtaining estimates of the intellectual functioning of different population groups. The subtests used are chosen for their validity in correlating with full scale IQ (Kaufman, Ishikuma & Kaufman-Packer 1991), their composite reliability estimates and standard error of measurement in estimating VIQ, PIQ and FSIQ (Schretlen, Benedict & Bobholz, 1994) and their clinical validity (Silverstein, 1982).

Prior to the development of the WAIS-III, a number of studies examined the ability of short-forms of its predecessor, the WAIS-R, to accurately assess intellectual functioning (DeVinney et al., 1998). A review of the most commonly used short forms of the WAIS-R concluded that they appeared to be valid tools for use with the general population (DeVinney et al., 1998). It was, however, highlighted that research into the utility of short forms of the WAIS-R with individuals with a learning disability was limited.

A study of the use of short forms in a vocational rehabilitation service (Clayton et al., 1986) found a substantial number of misclassifications of learning disability. This led the authors to caution against the use of short forms with those with intellectual

disabilities, particularly when used to determine eligibility for service provision. Crawford et al. (1992) also advise against the use of short forms other than obtaining a cognitive screen and report that for those who score markedly below the population mean, prorating will underestimate the individuals' full scale IQ. Again highlighting the implication for service provision if people are misclassified.

Nagle and Bell (1995) explored the use of Kaufman's "amazingly" short forms of the WAIS-R with adolescents with a learning disability. The three short form assessments suggested by Kaufman et al. (1991) included a two subtest short form, comprising of information and picture completion, a three subtest short form in which digit span was added and a four subtest short form comprising of similarities, arithmetic, picture completion and digit symbol. Nagle and Bell (1995) report that all of these short forms are highly correlated with the complete battery IQ's and add that the four subtest short form fared better than the others. Similarly, Minshew, Turner and Goldstein (2005) examined the use of short forms in another group whose profile is also atypical, namely those with autism, and also found good predictive validity.

In parallel with the WAIS-III came the development of the Wechsler Adult Abbreviated Scale of Intelligence (WASI) (Wechsler, 1999). This scale was developed to meet the increasing need for a less time-consuming, valid and reliable estimate of intelligence. The assessment provides two forms. The first includes two: subtests, Vocabulary and Matrix Reasoning, while the other incorporates four subtests: Vocabulary, Block Design, Similarities and Matrix Reasoning. Both the

items of the WASI and the underlying concepts are reported as being parallel to those measured by the WAIS-III (1997).

The WASI assessment is proposed as being a valid and reliable assessment tool to be used under the following circumstances: to provide an estimate of IQ rapidly and efficiently; for screening; re-testing; to provide estimates of cognitive functioning for clinical populations; to help inform decisions about therapeutic interventions, vocational direction, rehabilitation and training and for research (Clayton, et al., 1986).

The authors of the WASI (Wechsler, 1999) suggest that this assessment may be preferable to using short-forms of the Wechsler scales for a number of reasons. They argue that the short forms do not have independent norms, that a number of variants of short forms have been proposed which can cause confusion for the clinician about the best one to use and the samples on which the short-form results are based may not be representative. Clinicians have, however, traditionally tended to use short-forms of the Wechsler Scales (DeVinney et al., 1998; Kaufman et al., 1991) and it is likely that they will continue to do so. This is for a number of reasons: they are familiar with, and experienced in using the assessment, they have received training in its administration and interpretation and budget constraints may prevent the purchase of new assessments (Jeyakumar et al., 2004).

In addition, the WASI may have a number of specific limitations when used with people with a learning disability. Whilst the WASI includes people with a learning disability (referred to as mental retardation in the manual) in its standardisation sample, the number is small. Only 119 people are included and people with Down Syndrome are presented as a separate group with no clear information about their level of functioning. It is, therefore, difficult to identify the validity of the WASI in accurately estimating their cognitive ability. In addition, the manual identifies that only 87% of participants with a learning disability had full scale IQ scores of 70 or lower as measured by the WASI, suggesting that the assessment would misdiagnose 13%. This may appear to be a reasonable error rate for a screening test, however the inclusion criteria for the learning disability sample group identify another potential difficulty.

The sample only includes those people with a mild learning disability (significant intellectual impairment) who have full scale IQ, verbal IQ and performance IQ all under 70. For those with a moderate learning disability (severe intellectual impairment) full scale IQ, verbal IQ and performance IQ are all 55 or under. Recent research, however, suggests that this uniform profile is quite unusual for people with a learning disability (Murray et al., 2003). For example, the study found that while 41% of the participants had a severe intellectual impairment, only 20% had a verbal IQ and 25% had a performance IQ that fell within this range. This would suggest that the sample used in the WASI might not be representative in terms of cognitive profile.

The WASI manual acknowledges a number of limitations, both generally and in relation to people with a learning disability. The test was not found to have sufficient specificity for distinguishing degree of learning disability and the sample was not randomly selected. It is also acknowledged that the assessment sacrifices some degree of accuracy to enable it to be less time-consuming. As such it is not a comprehensive measure of cognitive functioning. The authors, however, conclude that the WASI is:

“A standardised, normed and validated short form of both the WISC-III and the WAIS-III and provides a reliable and valid estimate of verbal, performance and general intellectual functioning.” (page 3, WASI manual, 1999).

In summary, intellectual functioning is one of the key criteria in diagnosing learning disability. There are, however, many difficulties when it comes to assessing the intellectual functioning of a person with a learning disability. Despite the criticisms of both intellectual assessment in general and the Wechsler tests in particular, they continue to be the most reliable and valid tools available in the diagnosis of clients with a learning disability. The clinician must, however, be aware that this is a contentious area where, if the defining criteria are adhered to too strictly, many individuals may be denied access to services. In parallel with this, however, is an increasing pressure to identify a reliable and valid tool which is less time-consuming but gives a robust indication about whether an individual has a learning disability or not. While the WASI was developed as a screening tool, it has a number of limitations when applied within learning disability services and there is also a strong likelihood that clinicians may wish to continue to use short forms of assessments that they are already experienced in using.

It should not, however, be forgotten that intellectual functioning forms only one criterion of the definition of a learning disability. The BPS (2001) acknowledge this and recommend that psychometric testing alone should not be used in diagnosing learning disability or allowing or denying the individual access to services. The BPS (2001) also emphasise the need to take the individuals' adaptive functioning into account. The following section will, therefore, examine adaptive functioning in more detail.

1.4. Adaptive functioning

The following section will explore the concept of adaptive functioning, the second factor relevant to diagnosis of LD.

1.4.1. Defining adaptive functioning

The concept of adaptive behaviour as pertaining to the definition of learning disability was considered in the 13th century when questions about the individual's ability to competently carry out everyday tasks was, if somewhat crudely, used to assess the individual's adaptive functioning. However, Heber's 1961 'Manual on Terminology Classification in Mental Retardation', is reported to be the first official textbook to incorporate adaptive behaviour as part of the diagnosis of learning disability (Raynes, 1987). Heber defines the concept of adaptive behaviour as:

"The effectiveness with which the individual copes with the nature and social demands of his environment" (page, 61).

Other definitions of adaptive functioning include:

“The interplay between the individual and the social environment and can be conceptualised in terms of role performance and role satisfaction across multiple life domains, such as cognitive abilities, performance in school or at work, interpersonal relations, age- appropriate capacity for self care, and the capacity to enjoy life including using leisure time for self-fulfillment” (Bird (1999) as cited in Winters Collett & Myers, 2005, page 4).

The British Psychological Society also provides a definition of adaptive functioning in relation to the diagnosis of learning disability and conceptualises adaptive functioning as:

“Very broad and relates to a person’s performance in coping on a day to day basis with the demands of his/her environment. It is, therefore, very much related to a person’s age and the socio-cultural expectancies associated with his/her environment at any given time. It is concerned with what a person does (i.e. actual behaviour/ performance). (BPS, 2001, page 5).

Similarly, the American Association of Mental Retardation also gives a clear account of its conceptualisation of adaptive functioning and considers the effects that limitations in adaptive behaviour has upon a person’s life:

“Adaptive behaviour is the collection of conceptual, social, and practical skills that people have learned so they can function in their everyday lives. Significant limitations in adaptive behaviour impact a person's daily life and affect the ability to respond to a particular situation or to the environment.” (AAMR, 2002, page 3).

Kanaya, Scullin and Ceci (2003) argue that there is ambiguity in the definition of ‘limited adaptive skills’, required for the diagnosis of learning disability, due to the variability in the assessment methods used, as some clinicians use subjective judgements to determine limited adaptive behaviours. Levels of adaptive functioning

remain central to the diagnosis of learning disability and the results of assessments are used to determine level of need and service planning (Winters, et al., 2005).

1.4.2. Measurements of adaptive behaviour

Winters et al. (2005) note that interest in the development of measurements of adaptive behaviour has been determined by a convergence of clinical work including the development of the diagnostic and statistical manual of mental disorders, (DSM-IV- TR), (American Psychiatric Association, 2000), which identifies functional impairments in diagnostic categories, and evidence based practices in which improvement in functioning is identified as outcome measures. These factors have resulted in a variety of tools, which measure adaptive behaviour in different clinical populations. This section will, therefore, focus on the most frequently used adaptive behaviour scales for people with a learning disability.

Currently, the most widely used measure of adaptive behaviour is the Vineland Adaptive Behaviour Scales (Vineland), (Sparrow, Balla & Chicchetti 1984). This scale was a revision of the Vineland Social Maturity Scale (Doll, 1935) and can be used in the assessment of learning disability. The Vineland has recently been updated to the Vineland Adaptive Behaviour Scale – Second Edition (Vineland II) (Sparrow, et al., 2005); however, as it has just been released for use, there do not appear to be any studies examining its validity and reliability. This section will, therefore, focus on the utility of the original Vineland Adaptive Behaviour Scales (Sparrow, et al., 1984) as one of the assessments used in learning disability services.

The Vineland Adaptive Behaviour Scales (Sparrow, et al., 1984) require the assessor to carry out a semi-structured interview with an informant who knows the client well. The assessment contains multiple forms that can be used by parents and teachers. The survey form is the most frequently used and contains 297 items reflecting a developmental skill in the following areas, communication, daily living skills, socialisation, motor skills and a maladaptive behaviour domain.

The Vineland (Sparrow, et al., 1984) was said to have good psychometric properties (Widaman & McGrew, 1996) but is observed to correlate only poorly to moderately with measures of intelligence and receptive language (Winters et al., 2005). The normative data was collected in 1981 from a sample of 3,000 children and young people aged from birth to 18 years.

The Vineland (Sparrow, et al., 1984) had been recommended by the World Health Organisation (1992) and the Royal College of Psychiatrists (2001) as a diagnostic measure of adaptive functioning. It also met the full requirements of the American Association of Mental Retardation's definition of adaptive functioning (Luckasson, et al., 2002) and is the preferred assessment by some learning disability services (Evers & Hill, 1999). The Vineland (Sparrow, et al., 1984) had advantages over many other assessments of adaptive functioning, in that it has been around long enough to obtain psychometric data. It had supplementary data available for clients with a learning disability and the items had a low enough 'floor' to allow for

assessment of this client group. It could also be used as a comparison with same age peers (Beail, 2003).

There have, however, been many criticisms of this assessment. Beail (2003) argues that the normative data used with adults with a learning disability was small, highlighting psychometric deficiencies. Winters et al. (2005) added that the normative data was outdated and the item content had poor face validity. The items used did not account for improvement in technology and changes to the living circumstances of the client. Beail (2003) argues that when the normative data was collected in 1981 many clients lived in institutional settings and did not have the opportunity to participate in activities of daily living, with nursing staff carrying out even the most basic of tasks.

Hospital closure policies have seen a dramatic shift in the care for people with a learning disability as many people now live in either individual tenancies or group homes. The Vineland (Sparrow, et al., 1984) did not account for this and the changes in technology that occurred since its development, therefore, some of the items of the assessment were outdated. As Beail observes, it is more adaptive to be able to recall a four digit pin number than to write a cheque.

The revised version, Vineland II, (Sparrow, et al., 2005) hopes to address these criticisms with updated norms, expanded age ranges and improved items (Sparrow, et al., 2005).

Another commonly used measure of adaptive functioning is the Adaptive Behaviour System (ABAS) (Harrison & Oakland, 2000). It was specifically intended for use with developmental delayed individuals between the ages from birth to 89 years. As with the Vineland (Sparrow, et al., 1984), the ABAS also have a recently updated version, the Adaptive Behavior Assessment System – Second Edition (ABAS-II) (Harrison and Oakland, 2003). Until the release of the Vineland –II, the ABAS-II claimed to be the only assessment to incorporate the AAMR (2002) guidelines for evaluating adaptive behaviour. The Vineland –II also incorporates these guidelines.

The ABAS – II (Harrison & Oakland, 2003) also relies on information obtained from semi-structured interview with an informant and has parent, teacher and day provider forms. It also allows for measurement of infant and preschool behaviours. The assessment incorporates the adaptive behaviour domains of communication, community use, functional academics, school/home living, health and safety, leisure, self care, self-direction, social and work.

Harrison and Oakland, (2003) report that the ABAS –II scales have good psychometric properties with moderate to good interrater reliabilities between teacher–teacher and parent–parent. They note, however, lower correlations between parents and teachers. Winters et al. (2005) report that the primary disadvantage of the ABAS-II and its predecessor the ABAS, is the absence of published applications. This, therefore, highlights the difficulty in determining its validity in clinical practice.

1.4.3. Difficulties in measuring adaptive behaviour

Assessments of adaptive functioning heavily rely upon the information provided by an informant. This can impact upon the validity of the assessment as the informant may over or underestimate the client's abilities. This is especially pertinent in learning disability services where basic knowledge about learning disability has been found to be lacking in care staff (McKenzie et al. 1999). Further difficulties arise with the rapid change over in staff that occurs as a result of burn-out and stress (Sharrad, 1992). This causes practical difficulties when a review of the client's abilities is required and the member of staff who provided the baseline information may have moved job. The process of relying on informant information further highlights the difficulties encountered in the attempt to diagnose clients with a learning disability.

Winters et al. (2005) add that it is difficult to obtain information on all of the items of adaptive behaviour scales if the suggested approach of a semi- structured interview is carried out. An additional difficulty with measures of adaptive functioning is that they are not culturally specific and therefore, do not adequately address cultural contexts (Winter et al., 2005). The most commonly used assessments of adaptive functioning the ABAS –II (Harrison & Oakland, 2003) and the Vineland and its successor, are American. The questions may, therefore, need to be adapted to suit other cultural needs. This could further reduce the validity and reliability of the assessments if the scoring systems are used.

Assessments of adaptive functioning are necessary in the diagnosis of learning disability. As with intellectual assessments, the measures available are far from perfect, therefore, caution needs to be taken when interpreting and feeding back the results to clients and carers. The Vineland Adaptive Behaviour Scales (Sparrow, et al., 1984) were considered to be the gold standard of their day and it is possible that the updated version may exceed the originals impressive properties. Likewise, the ABAS-II (Harrison & Oakland, 2003) appear to be effective in incorporating the measures of adaptive functioning identified by the American Psychiatric Association and the American Association of Mental Retardation, as domains required to be assessed for a diagnosis of learning disability. As with intellectual assessments there remains a need to develop a more accurate measure of this client group's ability, particularly as they are relied upon to inform the diagnosis of learning disability.

The concept of adaptive functioning, as with learning disability, is a social construct and as such assessments periodically require to be updated in order to assess societal concepts of adaptive behaviour. As previously reported, the Vineland Adaptive Behaviour Scales (Sparrow, et al., 1984) and the Adaptive Behaviour Assessment System (Harrison & Oakland, 2000) have been revised to incorporate changes in society and technology.

When the concept of 'Idiocy' was first discussed in medieval times, measures of adaptive functioning included having the ability to sow a field or have knowledge of the financial importance of farm animals (Neugebauer, 1996). Nowadays it is

considered important to know how to use a computer and /or a mobile phone and current assessments reflect this. The British Psychological Society (2001), recognise the difficulty in defining and measuring adaptive functioning and advise that the assessments used should be “norm referenced, criterion referenced and those of the skills checklist variety” (page 7) such as the Vineland Adaptive Behaviour Scales (Sparrow, et al., 1984). The BPS (2001) note that the item content of assessments used for the purpose of diagnosing learning disability may extend the definition of adaptive behaviour that they have used. This further acknowledges the ambiguity in the interpretation of measures of adaptive behaviour.

The diagnosis of learning disability relies upon an assessment of adaptive functioning as well as an intellectual assessment. As with intellectual assessments adaptive behaviour assessments take time to administer (Winters et al. 2005). Clients referred to learning disability services can endure a lengthy wait before services are allocated. It is, therefore, recognised that there is a need to find a more effective way to identify those who require the services (Evers & Hill, 1999). Screening tools, although not a replacement for a comprehensive assessment, can provide a means of quickly ensuring that clients are admitted into a service or referred elsewhere. The following section will discuss the utility of screening tools in learning disability services.

1.5. Screening tools

The British Psychological Society (2003) acknowledges the use of screening tools in clinical psychology services, especially where there are limited resources for a large population. In these circumstances the use of screening tools have a pragmatic use. The aim of screening tools in learning disability services is to give an initial indicator of whether an individual is likely to have a learning disability or not. This may be for a number of reasons including legislative, gate keeping or to ensure that the individual receives appropriate support in relation to legal proceedings.

Bliss (2002) utilised the Casemix scale (Pendaries, 1997) and a two-page questionnaire based on the indicators outlined by Burton (1997) to help verify whether a person was likely to have a learning disability. These indicators include an administrative definition of learning disability, which examines the individual's previous contact with services, such as attendance at special school. The author noted that the latter tool 'appears to be helpful' (page 25) and that the preliminary review of the Casemix scale (Pendaries, 1997) suggests that it is 'a good, easily completed measure of level of learning disability and difficult behaviour.'(page, 25). Unfortunately, no information was given about the psychometric properties of these assessment measures. Similarly, Evers and Hill (1999) make reference to a screening questionnaire completed by referrers in order to help identify those people who clearly have a learning disability, but no details are given about this.

Sharp et al. (2001) examined the utility of the ability to tell the time as an indicator of learning disability. They found a significant correlation between the ability to tell the time and full-scale IQ scores. They did caution, however that this was merely a crude indicator, which did misclassify some individuals.

McDonnell and Hames (2005) also developed a screening tool for use by non-psychologists to help identify parents with a learning disability. The questionnaire, designed as a pragmatic means of ensuring service provision was targeted where needed, consisted of a short reading passage and questions pertaining to this. The results of this pilot study showed promising results in its ability to correctly identify parents with a learning disability, however, the small sample group limits its efficacy.

Screening indicators have also been identified as useful within the legal system. Hayes (2002) argues that people with a learning disability are significantly over-represented in the criminal system in many western societies, whether as perpetrators, victims or witnesses of crime. In Australia, The NSW Law Reform Commission, stated in relation to this that:

‘The first issue which must be addressed in any (police) Code of Practice is guidelines for identifying whether a person being questioned, whether suspect, victim or witness, may have an intellectual disability’ (New South Wales Law Reform Commission, 1996, p107-108.)

In Britain, The Police and Criminal Evidence Act (1984) states that if the police suspect that an individual has a learning disability then an 'appropriate adult' should be present to aid communication, provide advice and ensure the individual is treated fairly. Guidance from the Scottish Office (1998) identified the following as indicators of a learning disability: evidence of special schooling, attendance at day services, living in supported accommodation. Again, however, there has been little research into which indicators are the most valid and predictive of whether an individual has a learning disability or not.

Screening tools have a pragmatic use in clinical services. They can provide a means of ensuring equity of service to those who need the services the most. Patients or clients are seen quicker and clinicians become more efficient in the delivery of service as it allows the saved time to be spent on areas such as research and development. The following section will examine the current delivery of service to clients with a learning disability.

1.6. Service Provision

As previously discussed, the 1971 government paper, "Better services for the mentally handicapped", (Department of Health, 1971) saw the start of a shift of service provision from hospital based services to community care. Andrews, (1996) however, reports that the foundations of community care were set in the early 19th century in Scotland as landlady's started to take in boarders with a learning disability at the request of the parish. Community learning disability teams (CLDT's) began to

emerge throughout the 1980's and although providing services to those living at home, became actively involved in service development and the deinstitutionalisation process (Brown & Wistow, 1990).

The role of CLDT's changed as a result of The NHS Community Care Act (Department of Health, 1991), in that the responsibility for service development and individual service planning became that of the local authority (Greig & Peck, 1998). Much of the 1980's and 1990's focussed upon moving individuals from hospitals into a community setting.

During this time a number of government policies emerged which, although not directly targeted at this population group, nevertheless impacted upon the lives of people with a learning disability. These included the Education (Scotland) Act (Scottish Office, 1980), which placed a responsibility upon local education authorities to meet the educational needs of all children living in the area, including those with special needs. The Housing Act (Scotland), (Scottish Office, 1987) required local authorities to consider the housing needs of all people living in the community. Social Inclusion: Opening the door to a better Scotland (Scottish Executive, 1999) promoted social inclusion to those on the fringes of society. Designed to Care (Department of Health, 1997) introduced clinical governance to health services with the purpose of ensuring equity of health service provision to all. This policy document emphasised the need for user involvement in health services.

Many of these policies ensured that people with a learning disability were afforded the same rights as everyone else but it was not until the “The Same as You?” (Scottish Executive, 2000) that government policy was specifically targeted at people with a learning disability.

‘The Same as You?’ (Scottish Executive, 2000) was the first government document in 20 years that attempted to address the needs of people with a learning disability. The purpose of the policy was to ensure that people with a learning disability had a say in the issues that were important to them and were more included in society. The document defined people with a learning disability as having:

“ A significant, lifelong condition that started before adulthood, that affected their development and which means they need help to understand information, learn skills and cope independently” (page, 3).

This definition deliberately avoided the use of IQ cut off scores as justification of ensuring that individuals with developmental disorders, such as autism, would be able to access learning disability services to meet their needs. This definition has, however, implications for the already stretched services that provide support to people with a learning disability, as this potentially could increase the referral rate of people requesting services. As well as the changing the way that learning disability services are provided, this definition is an example of the socially constructed diagnostic criteria of learning disability. The ‘Same as You?’, therefore, may be instrumental in changing the shape of learning disability services much in the same way as ‘Prerogativa Regis’ was in the 13th century. The impact of extending the

definition of learning disability to those whose IQ exceeds 70 on clinical psychology services may force a change in the way in which psychological services are provided to the learning disability population group.

1.6.1. Clinical psychology services for people with a learning disability

There has been an increasing need for clinical psychology learning disability services to develop a means of rationing the services they provide because of the high demand for services and relative scarcity of staff Bliss (2002). A survey by Rose et al. (2001), of clinical psychology learning disability services, found a wide diversity in staffing levels across Britain, with almost a third of departments having 1 or fewer whole time equivalent clinical psychologists working in this specialty. These figures fall far short of BPS guidance for purchasers (BPS, 1994). As a result, one issue that is increasingly being faced by learning disability services is that of clarifying the population that the service covers and of then identifying appropriate referrals to the service (Bliss, 2002).

As will be discussed below, intellectual assessment has a number of important roles within learning disability services. It is central to both defining a learning disability and, more crucially, identifying the relative cognitive strengths and weaknesses of the person to ensure that appropriate levels of support are given (Fidler & Hodapp, 1998). The assessment of whether an individual meets the criteria for a learning disability has also become relevant for both the provision and rationing of specialist learning disability services.

In theory, given the clear criteria for a learning disability, identifying those people who have a learning disability should be relatively straightforward. In practice, however, health professionals encounter a number of difficulties in identifying who is eligible for learning disability services. These difficulties can centre around arguments of the validity of the definition itself, with some authors arguing that the definition is flawed because of the reliance on IQ scores (Whitaker, 2003). Whitaker (2003) argues that the criteria have little practical use in identifying which people need the specialised input of learning disability services. He argues that the cut-off point of IQ less than 70 is essentially arbitrary and that there is no evidence to suggest that those with an IQ of 69 are significantly less able to cope with life than those with an IQ of 71.

Other difficulties may centre around a lack of clarity about what a learning disability is. Research has shown that the general public (Antonak, Fiedler & Mulick, 1989), health staff (Slevin & Sines, 1996) and social care staff working in learning disability services (McKenzie et al., 1999) have limited knowledge about what the criteria for a learning disability are. Similarly, clinical psychologists, who are often the key professionals in assessing whether an individual meets the criteria for a learning disability, show confusion about the terminology. A number of authors make reference to the concept of 'borderline learning disability' rather than borderline intellectual functioning to describe individuals with IQs between 70- 79 (Bliss, 2002; Rose et al. 2001; Whitaker, 2003).

A number of clinical psychology learning disability services have also been found to provide a service to individuals who fall within the borderline intellectual functioning range. Rose et al. (2001) found all but 12 of the 71 clinical psychology services in their survey, accepted referrals for people with borderline intellectual functioning. This may be as a result of referrers being unsure about what a learning disability actually is. An early study by Mercer (1973) found 40% of people identified by community agencies as being 'mentally retarded' actually had an IQ over 70. Likewise (Bliss, 2002) found that, at the time of their study, 13 of 23 people who had been referred and were on the waiting list for clinical psychology learning disability services had a mild or no learning disability.

The inclusion of individuals, who fall within the range of borderline intellectual functioning, within the remit of learning disability services, potentially has large implications for the pressures placed upon the services. Whitaker (2003) notes that even including people with an IQ up to 75 (which allows for the 95 % confidence interval around IQ 70) would increase the numbers falling within learning disability criteria from 2.23% to 4.73%.

While it could legitimately be argued that services should be provided according to the needs of individuals, rather than the level of their intellectual functioning, specialist services for people with a learning disability have been developed, staffed and resourced to meet the needs of a particular client group. Expanding this client group means that those who may be in most need of services, do not receive them.

Bliss (2002) described a learning disability service where nearly half of clients on the waiting list had been waiting well over the patient Charter Standard of 26 weeks. It was found that, after introducing new criteria for their service, which only included those with moderate to severe learning disability and additional challenging behaviour, that only 6 of the 23 referrals on the waiting list were appropriate.

As a result of the demand for learning disability services, a number of clinicians are searching for means of screening referrals to determine if they are appropriate and to refine the identification of those who have a learning disability (Bliss, 2002; Burton 1997; Evers & Hill, 1999; Pendaries, 1997). There have been two main approaches to this; developing screening indicators including factors such as previous contact with learning disability services and utilising short-forms of intellectual assessments. The methods described to ensure people receive services will reduce the waiting time for individuals accessing the appropriate services. Team members can carry out comprehensive assessments on the individuals' strengths and needs once screening has taken place. This will allow adequate time for a diagnosis of learning disability to be given. Once an individual receives this diagnosis it will impact greatly on many aspects of their life. The following section will examine how a diagnosis of learning disability affects the life of individual.

1.6.2. Impact of diagnosis of learning disability

A diagnosis of learning disability can impact upon several areas of a person's life. It can allow a person to access appropriate services such as community learning

disability teams, or it can put place the person's skills under more scrutiny than the person with normal intelligence, as legal proceedings are implemented if the person is seen as not coping. It can also impact upon an individual's financial status. Kanaya et al. (2003) reports that in order to qualify for state benefits in the USA, evidence of sub average intellectual functioning and deficits in adaptive functioning are required. Similarly, in the UK to qualify for disability living allowance a person must show evidence of limitation in daily living skills (Department for work and pensions, 2005).

If a person with a learning disability wishes to engage in a sexual relationship, an assessment of their and their prospective partners capacity to consent to a sexual relationship is assessed (Murphy & O'Callaghan, 2004). The need to protect from exploitation and continuing to allow the individual their human rights is a difficult balance, however, this would not necessarily be an issue for the individual who falls out with the intellectual range for learning disability.

Similarly, capacity to make financial decisions is routinely assessed amongst those with a learning disability. Suto et al. (2005) found the financial decision abilities in a group of people with a mild learning disability weaker than those with normal intelligence. Clearly, it would seem obvious that the lower a person's intellectual functioning the more difficulty they would have in these types of decision making processes. Whitaker (2003), however, observes little difference in ability between



those who fall out with the learning disability range of intellectual functioning and those with a learning disability.

Parents with learning disability are more likely to have their child taken into care than the rest of the general population (Booth & Booth, 1998). Tymuchuk (1992) argues that this is because people with learning disabilities have their parenting skills scrutinised more than any other group of parents. This implies that it is important that individuals are not misdiagnosed as having a learning disability. Arnold (2003) acknowledges, however, that people with a learning disability can be good parents if the right supports are put in place.

People with a learning disability who come into contact with the law, either as a witness or victim of a crime or a perpetrator, have the right to have an appropriate adult assigned to them to ensure that they have an understanding of the process (Scottish Office (1998)). Difficulties arise if the police are unable to identify those with a learning disability. It is important in this situation that a person has a diagnosis in order to receive their rights.

Having a diagnosis of learning disability can ensure that a person is given certain rights as shown above. Likewise, it can put people under more scrutiny. It is, therefore important that people have access to services quickly in order that a full assessment of their needs can be carried out. The following section will summarise the introduction of this thesis and discuss the aims of this study.

1.7. Summary and Aims

As show above, there have been many changes over the years in the classification and terminology used in the diagnosis of learning disability. It is apparent that the concept of learning disability is socially shaped and defined. There are now further pressures to amend the definition and classification again and to include those whose needs would be better met by learning disability services (Scottish Executive, 2000).

The present definition is, however, clear about the characteristics of those regarded as having a learning disability. Intellectual functioning and limited adaptive abilities have always been included in the definition of learning disability (Pulsifer, 1996) and the British Psychological Society recommends that an assessment of both are necessary before a diagnosis is given (BPS, 2001). There remain, however, a number of pressures for change.

It can be argued that current assessment measures may not be sufficiently reliable and valid to do the job. Intellectual assessments take time to administer and needs to be carried out, or be supervised by a qualified psychologist (BPS, 2001). Likewise, there is concern about the validity of the tools used to obtain information about a client's adaptive functioning, with criticisms aimed at informant bias and outdated norms (Beail, 2003).

Unfortunately for the client who is awaiting diagnosis this can take some time, therefore, there is a need to ensure a quicker way to ensure access the services they need or for those who do not meet referral criteria, quicker referral on to the appropriate services.

Two ways of addressing this have been developed: short forms of intellectual assessments and screening tools based on adaptive skills. As has been outlined above, however, there has been little research in relation to the validity of the former with people with a learning disability and limited systematic evaluation of the latter. This study, therefore, has the following aims:

- To develop a screening tool and examine it's reliability and validity as a measure of discriminating between those with and without a learning disability.
- To examine the ability of the parallel form of the two test and the four test WASI to correctly distinguish between those who do and do not have a learning disability.

2. Method

The purpose of the study is to examine the use of two screening tools in learning disability services. The study is, therefore, in two parts:

Part one will explore the development of a screening tool, The Learning Disability Screening Questionnaire, (Appendix 1) and its ability to discriminate between those with a learning disability and those without.

Part two of the study will examine to which extent the two subtest and four subtest short forms of the Wechsler Adult Intelligence Scale–Third Edition (Wechsler, 1997) that are used in the WASI (Wechsler, 1999) can discriminate between those who have a learning disability and those who do not have a learning disability.

Part three of the study will compare the Learning Disability Screening Questionnaire, with the two and four parallel subtests of the WASI in their ability to discriminate between those with a learning disability and those without.

2.1. Ethical Approval

Agreement was given by the Caldicott Guardian in the participating health board to collect data from the case files of the participants included in the study (Appendix 2a). Further contact was made with the Caldicott Guardian requesting permission to use the data to write this study and disseminate the results for publication (Appendix 2b). This permission was given.

2.2. Part One- The Learning Disability Screening Questionnaire

2.2.1. Procedure

Existing clinical psychology case-notes for all clients referred to the participating community learning disability service were examined. Case-notes were excluded if:

1. There was insufficient information to score the screening tool i.e. 3 or more items could not be completed.
2. If an assessment of whether someone had a learning disability or not had not taken place.
3. If an assessment was incomplete for some reason.

Information was gathered on both groups, those with a learning disability and those without, who were referred to services, in relation to age, gender, full scale IQ, verbal IQ and performance IQ. All of the individuals with a learning disability included in the study met the definition criterion of having a full scale IQ of 69 or below. In addition, participants met the other two defining criteria of a learning disability i.e. impaired adaptive functioning and onset before the age of 18.

2.2.2. *Developing the Learning Disability Screening Questionnaire*

The screening tool was developed on the principles that any measure must be objective, reliable and valid. In addition it must be standardised i.e. the measure

should be developed from information obtained from a group similar to that with whom it is intended to be used.

Selecting the initial screening tool items

One of the simplest ways of measuring validity is via content validity. Content validity can be derived from subjective judgement that the items are representative of the content area. Content validity examines how a measure or procedure appears. It is concerned with the representativeness of the questions being asked (Eby, 1993).

This was established for the screening tool in the following way:

The questions chosen for the screening tool were selected based on a number of criteria including:

- Previously published screening tools used with the learning disability population group (Bliss, 2002; Hayes, 2002; McDonnell & Hames, 2005; Pendaries, 1997).
- Previous research, which identifies ability to tell the time, as a possible indicator of learning disability (Sharp et al.2001).
- Items covered in published and established measures of adaptive behaviour such as the ability to read and write (Harrison & Oakland, 2000; Sparrow et al., 1984).
- Items, which are related to the childhood onset criterion of a learning disability, such as the individual's attendance at special education (Burton, 1997).
- Items, which require a broad range of adaptive skills to be carried out successfully and call for social competence, i.e., living alone and working

(Greenspan & Granfield, 1992). It is recognised that a person with a learning disability is less likely to marry than a person with normal intelligence (Hall et al., 2005). Living with a spouse could, therefore, be regarded as an indicator of not having a learning disability.

- Policy document recommendations, for example, the 'Same as You?' (Scottish Executive, 2000) recognises that the individual with a learning disability requires support in many areas of daily living. It recommends that local authorities develop services to enable the person to work, socialise and to support him/her when their parents are no longer able to provide care.
- Clinical judgement of experienced psychologists.

Based on the above criteria, 7 items were included in the screening questionnaire: These were:

1. Can the client tell the time?
2. Can the client read?
3. Can the client write?
4. Does the client live independently?
5. Does the client have a job?
6. Has the client had previous contact with learning disability services?
7. Has the client had special schooling?

Developing scoring criteria

Each item was given a score of 1 or 0. For items 1-5 a score of 1 was allocated if the person had the skill e.g. if they could read. For items 6-7 a score of zero was given if the item applied e.g. if they attended special school.

The scoring system was piloted by asking 2 psychology assistants to review a number of case files and indicate any areas of difficulty using the scoring system. This highlighted that for some clients, some information was not available in the case-notes, making the total scoring system invalid. As a result, this total score was then converted to a percentage score to allow for items where information was missing. In addition, clients who had insufficient information in case notes to answer 3 or more questions were excluded.

The questionnaire was designed so that the higher the score, the less likely it was that the person would have a learning disability.

2.2.3. Statistical Power

As there has been very little research investigating the effect size of the use of short-form assessments or screening tools in learning disability services, estimates will be based on research carried out with the general population. These report mostly medium to large effect sizes. As the purpose of the study is to develop a tool that has high discriminative and predictive value a large effect size is anticipated (ranging from 0.35-0.80 depending on the test used (Cohen, 1992).

The results will be analysed using a number of different statistical tests including Chi square analyses, correlations, t-tests, regression analysis and receiver operating characteristics curve analyses (ROC analysis) (SPSS package).

Using Cohen's (1992) criteria on statistical power, for a large effect size at $p < 0.05$, the following number of participants are needed in each group for power = 0.80:

- Chi square: (26)
- Pearson's product moment correlation: (28)
- t-test: (26)
- Logistic regression analysis/ROC analysis: (48)

2.2.4. Participants- Part 1: Learning Disability Screening Questionnaire

A total number of 160 participants were included in part one of the study, which was examining the discriminative qualities of the screening tool. Of the total number of 160 participants, 114 had a learning disability as defined by the inclusion criteria and 46 were identified as not having a learning disability. Of the 46 who did not have a learning disability, 34 fell within the range of borderline intelligence, 6 fell within the range of low average intelligence and 4 fell within the average range of intelligence. The remaining two participants fell within the range of learning disability in respect to their intellectual functioning, however, did not meet the remaining inclusion criteria for learning disability.

Data was available and collected on the age of 159 of the participants. Of these, the mean age was 31.8 (sd= 14.1). Of the 160 participants, 89 were male and 71 were female. A t-test showed those with a learning disability to be significantly older than those who did not have a learning disability ($t = 2.31$, $df = 157$, $p < 0.5$). A Pearson

Chi –Square found that there was no difference between the groups in relation to gender ($\chi^2 = 2407$, $df=1$, $p= 0.121$).

The number of participants in part one exceeds the requirements to achieve statistical power.

2.2.5. Validity, reliability and Objectivity

Tests and measurement tools are considered accurate if they are reliable, valid and objective (Dickens & Stallard, 1987). Objectivity indicates that any measure is as unbiased by personal opinion and feelings as possible, reliability ensures that the measure will produce consistent results across situations, observers and time, while validity indicates that the assessment measures what it purports to. There are many forms of reliability and validity and many of those introduced and defined in the section below will be used to assess the accuracy of the screening tools in this study. These include:

2.2.6. Face validity

This looks at whether the test or questionnaire seems to be measuring what it claims to, by reflecting the current knowledge base (Eby, 1993, Gross, 1996). Face validity for the Learning Disability Screening Questionnaire was established by gaining the views of a number of professionals working within a learning disability team, (speech and language therapy, community nursing, psychology, psychiatry,

physiotherapy and music therapy), about whether they felt the questions reflected the area of interest i.e. identifying whether someone had a learning disability or not. It was felt by all the professionals concerned, that each item appeared relevant.

2.2.7. Criterion-Related Validity

This examines the relationship between the designed questionnaire and an already validated existing measure (Crookes & Davies, 1998). In the present study the results obtained from the screening tool were compared with the clinical determination of whether someone had a learning disability or not, as defined by the three diagnostic criteria. This information was obtained from clinical psychology case-notes and was based on the outcome of: an assessment of intellectual functioning, using the WAIS-III (Wechsler, 1997), an assessment of adaptive behaviour, either the Vineland Adaptive Behaviour Scales, (Sparrow, Balla & Chicchetti, 1984) or the Adaptive Behaviour Assessment System (Harrison & Oakland, 2000) and a clinical history to establish childhood onset.

2.2.8. Construct Validity

This is reported to be the most difficult to achieve (Eby, 1993). Construct validity seeks agreement between a theoretical concept and a specific measuring device or procedure. There are two types of construct validity: convergent validity and discriminative validity. Convergent validity examines the relationship between two related constructs. In this study, scores on the Learning Disability Screening Questionnaire were correlated with individuals' scores on the Wechsler Adult

Intelligence Scale – III (Wechsler, 1997) and the other diagnostic criteria of learning disability.

Discriminative validity is the ability of a measure to discriminate between groups.

This was examined in the following ways:

1. The ability of each item on the screening tool to discriminate between those who had a learning disability and those who did not. A series of Chi Square tests were used to determine which item was able to significantly discriminate between the learning disability and non- learning disability groups.

2. Logistic Regression

A logistic regression was used to determine whether the items on the Learning Disability Screening Questionnaire could discriminate between both groups. The logistic regression measures the extent of accuracy in predicting group membership from a set of variables, where the outcome is dichotomous (Tabachnick & Fidell, 2001). The use of a logistic regression in this study, therefore, was to determine whether the items on the questionnaire could predict group membership between the two groups, those who have a learning disability and those who do not.

3. Receiver operating characteristics curve analyses

A receiver operating characteristic (ROC) curve analysis (Schoonjans, 1998) was used to examine how well the Learning Disability Screening Questionnaire discriminated between the people with and without a learning disability. The

ROC curves are used to determine the ability of a test to discriminate 'cases' from 'non-cases', that is, to make a correct diagnosis (Hayes, 2002). It is similar to the logistic regression in that it can be used to discriminate between those with a learning disability and those who do not have a learning disability, however, the main purpose of the roc analysis is to determine the sensitivity and specificity of the questionnaire. This will allow for an optimal cut off point to be set for the questionnaire. The ROC curve indicates that larger the area under the curve, the better the diagnostic test.

2.2.9. Social Validity

Social validity must cover areas that are of relevance to the group it is being applied to (Stanley & Roy, 1988). This was established by the fact that all of the items in the questionnaire were derived directly from research, documentation, policy guidelines or existing measures which were developed in relation to people with a learning disability. The measure would, therefore, be considered to have relevance for the group with which it was intended to be used.

2.2.10. Reliability

This refers to how consistently the test measures what it is measuring (Crookes & Davies, 1998). The following reliability measures will be included:

2.2.11. Inter-rater reliability

Inter-rater reliability is the extent to which there is agreement by two or more raters (Crookes & Davies, 1998). The inter-rater reliability of the screening tool was established by having two independent raters, a psychology assistant and a qualified clinical psychologist, score 75 questionnaires, based on the scoring system above. The Kappa statistic was then used to analyse inter-rater agreement for the categorical data of gender, time, reading, writing, living independently, having a job, previous contact with learning disability services and special education. Pearson's correlation was used to analyse the non-categorical data of age, verbal IQ, performance IQ, full scale IQ, gender and the percentage total of screening score.

Internal consistency

Items on a measure are divided into equivalent parts and correlations on scores calculated. As the items on the screening tool were not expected to be homogeneous this form of reliability was not calculated.

Alternate forms

This requires a parallel form of the questionnaire and was not, therefore relevant to the present study

Test-retest reliability

The same measure is administered on two separate occasions and the correlation between them calculated. As data was collected from case-notes, it was not possible to carry out this form of reliability.

2.2.12. Standardisation

The screening tool was standardised on the clinical groups, which were referred to community learning disability services. The comparison was also made between people with a learning disability and those who did not meet the diagnostic criteria because their intellectual functioning fell within the borderline range. This is often the two groups that clinical psychologists are asked to discriminate between, as it is unlikely that someone with average intelligence or low average intelligence would be referred to learning disability services. The screening tool was, therefore, standardised with the two groups with whom it would be used in clinical practice.

2.2.13. Objectivity

The Learning Disability Screening Questionnaire was based on research, previously published screening tools, policy documents and the clinical experience of psychologists working in this specialty. It was, therefore, not based on the personal view of researcher.

2.3. Part Two: Investigating Short- forms

2.3.1. Procedure

The existing clinical psychology case-notes for all clients referred to the participating community learning disability service used in part one of the study were also used in part two. Case-notes were excluded if:

1. If an assessment of whether someone had a learning disability or not had not taken place.
2. If there was insufficient data to ascertain a full scale IQ score.

Information was gathered on both groups, those with a learning disability and those without, who were referred to services, in relation to age, gender, full scale IQ, verbal IQ and performance IQ and the scaled scores of the WAIS III subtests. All of the individuals with a learning disability included in this part of the study met the definition criterion of having a full scale IQ of 69 or below. In addition, participants met the other two defining criteria of a learning disability i.e. impaired adaptive functioning and onset before the age of 18.

A logistic regression analysis was carried out on the data collected from the participants' WAIS III subtests that are included in the WASI. These include the subtests, vocabulary, and matrix reasoning which are incorporated in the two subtest WASI and the vocabulary, matrix reasoning, block design and similarities subtests that are incorporated in the four subtest WASI. The results were used to determine which of the short- forms best discriminated between the two groups.

2.3.2. Participants- Part Two

A total number of 275 participants were included in this part of the study. Of these 222 had a learning disability, as defined by the inclusion criterion, 53 were identified as not having a learning disability. Of the 53 who did not have a learning disability, 40 fell within the borderline range of intellectual functioning and 13 fell within the low average range of intelligence.

Of the 222 participants with a learning disability, the mean age was 34.9 (sd= 14.9). Of those 115 were male and 107 were female.

Of the 53 participants who did not have a learning disability, the mean age was 27.2 (sd=12.5). Of those 35 were male and 18 were female.

The number of participants in part two exceeds the requirements to achieve statistical power.

2.4. Part Three: A comparison of both methods of screening

A comparison was made between the results of the logistic regression of the two subtest short form, the four subtest short form and the Learning Disability Screening Questionnaire. The results were used to determine which of the forms of screening tools best discriminated between the two groups.

3. Results

3.1. Part One- Screening Tool

3.1.1. Reliability and Validity

Inter –rater reliability:

Inter –rater reliability for age, verbal IQ (VIQ), performance IQ (PIQ), full scale IQ (FSIQ) and the total percentage score (% total) of the screening tool was measured using Pearson’s correlation.

Table 1. shows the results:

Table 1. Inter –rater reliability for age, verbal IQ, performance IQ, full scale IQ and percentage total of screening score.

Factor	Number	p value	Significance
Age	74	1.00	p.< 0.01
VIQ	74	1.00	p< 0.01
PIQ	74	1.00	p< 0.01
FSIQ	75	1.00	p< 0.01
% total	75	1.00	p< 0.01

For all the results that could be computed using Pearson’s correlation, significance levels were less than 0.01 (2-tailed), (p< 0.01), indicating significant agreement between raters.

Inter-rater reliability for gender and all of the components on the screening tool, which include: ability to tell the time, reading, writing, living independently, having a job, previous contact with learning disability services and special schooling were measured using Kappa.

Table 2. reports these results:

Table 2. Inter -rater reliability for gender, time, reading, writing, living independently, having a job, previous contact with learning disability services and special education.

Factor	Number	Kappa value	Significance
Gender	75	1.00	p< 0.0001
Time	26	0.692	p < 0.0001
Read	39	0.896	p< 0.0001
Write	40	0.849	p< 0.0001
Indep. living	65	0.715	p< 0.0001
Job	51	0.783	p< 0.0001
LD contact	73	0.450	p< 0.0001
Special Ed.	41	0.693	p< 0.0001

A Kappa value of 1 indicates perfect agreement. The results show that there was perfect agreement between raters with regard to gender. A Kappa value of 0.7 is considered an acceptable level of agreement (Cramer, 1998) and above 0.75 is considered excellent (Clark–Carter, 1997). The results, therefore, show acceptable agreement between raters in the variable independent living and excellent agreement in the variables of reading, writing, and having a job. A Kappa value between 0.4 and 0.7 represents a fair to good level of agreement (Clark–Carter, 1997). The results show a fair agreement on the learning disability contact variable and good agreement on the time and special education variables.

3.1.2. Convergent Validity

This was measured by correlating the total percentage screening score with participants verbal IQ, performance IQ and full-scale IQ, using Pearson's Correlation. A significant positive correlation was found between participants verbal IQ and the total percentage score of the screening tool ($r = +0.723$, $p < 0.0001$) in that the higher the participants verbal IQ, the higher the total percentage score on the screening tool.

A significant positive correlation was also found between participants performance IQ and the total percentage score of the screening tool ($r = +0.699$, $p < 0.001$) indicating that the higher the participants' performance IQ, the higher the total percentage score on the screening tool.

There was also a significant positive correlation found between the full scale IQ of participants and the total percentage score of the screening tool ($r = +0.751$, $p < 0.0001$) in that the higher the participants full-scale IQ, the higher the total percentage score on the screening tool. These results indicate that there is a relationship between the screening tool and participants verbal, performance and full-scale IQ.

3.1.3. Discriminative Validity

A t-test was used to determine whether the screening tool could discriminate between those participants with a learning disability and those without in respect of verbal IQ, performance IQ, full scale IQ and the total percentage score of the screening tool.

Table 3. shows the verbal IQ, performance IQ, full scale IQ and the total percentage score of the screening tool between those with a learning disability and those without.

Table 3. Verbal IQ, Performance IQ, Full Scale IQ and Total percentage score between groups

LD		N	Mean	Std. Deviation
VIQ	yes	111	60.92	6.26
	no	45	78.38	8.04
PIQ	yes	113	60.33	7.63
	no	45	79.62	9.37
FSIQ	yes	114	57.32	6.82
	no	46	76.74	7.16
% total	yes	114	16.38	20.21
	no	46	66.87	19.95

Table 3 shows the differences in scores between the two groups. Participants with a learning disability have a lower mean verbal IQ, performance IQ and full scale IQ than those who do not have a learning disability.

The mean total percentage score of the screening tool for those with a learning disability is lower than those who do not have a learning disability.

When comparing verbal IQ, there was a significant difference between both groups in that those with a learning disability have a lower verbal IQ than those who do not have a learning disability ($t = -14.5$, $df = 154$, $p < 0.0001$). Similar findings occurred in the comparison of performance IQ ($t = -13.4$, $df = 156$, $p < 0.0001$) and full scale IQ ($t = -16.07$, $df = 158$, $p < 0.0001$).

There was also a significant difference between the groups in relation to the total percentage score of the screening tool ($t = -14.3$, $df = 158$, $p < 0.0001$), indicating that the screening tool can discriminate between those who have a learning disability and those who do not.

The data relating to the variables, FSIQ, PIQ, VIQ and percentage total were shown to be positively skewed, see appendix 3 for histograms and box plots. There were 4 outliers found in the non learning disability group in the FSIQ variable. There were also 3 outliers found in the non learning disability group in the VIQ variable and 3 outliers in the non learning disability group in the PIQ variable. Under normal circumstances, skewed data violates the use of parametric tests, however, Howell (1997), argues that parametric tests are sufficiently robust to be used with data that is not normally distributed.

3.1.4. Items on questionnaire

Pearson's Chi-Square was also used to ascertain whether the Learning Disability Screening Questionnaire could discriminate between both groups with regard to each item on the questionnaire. Table 4. Illustrates that each item on the screening tool is able to discriminate significantly between participants with a learning disability and participants without a learning disability.

Table 4. Questionnaire items and their ability to discriminate between learning disability and non learning disability groups.

Screening Tool Item	X2 value	df	Significance level
Ability to tell the time	26.38	1	0.0001
Reading ability	50.56	1	0.0001
Writing ability	62.89	1	0.0001
Living independently	49.53	1	0.0001
Having a job	9.82	1	0.0001
Previous contact	51.75	1	0.0001
Special education	44.59	1	0.0001

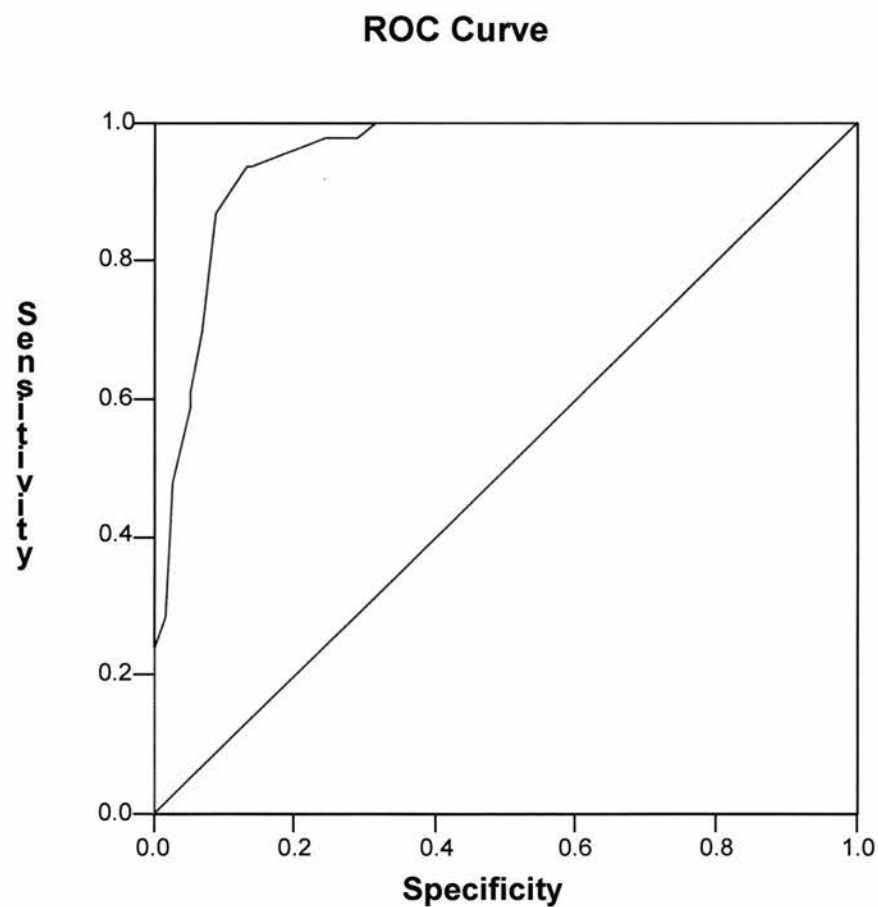
3.1.5. Receiver operating characteristics curve (ROC) analyses

A receiver operating characteristics curve analyses was used to examine the ability of the Learning Disability Screening Questionnaire to discriminate between those with a learning disability and those without in respect of their total percentage screening score. The purpose of ROC curves are to discriminate between cases and non cases

(Hayes, 2002). The area under the curve indicates the discriminative quality of the tool being measured. A perfect diagnostic tool would achieve an area of 1.00.

Graph 1. shows the results of the ROC curve of the Learning Disability Screening Questionnaire.

Graph 1. Roc Curve for Learning disability screening questionnaire



The area under the curve is 0.949 indicating a significant ability to discriminate between both groups.

Table 5. shows the coordinates of the roc curve from which the cut- off scores are selected. The cut off score chosen for use with the Learning Disability Screening Questionnaire is highlighted.

Table 5. Coordinates of the ROC curve

Positive if Greater Than or Equal To (a)	Sensitivity	1- Specificity
- 1.0000	1.000	1.000
7.0000	1.000	.526
15.5000	1.000	.377
18.5000	1.000	.325
22.5000	1.000	.316
27.0000	.978	.289
31.0000	.978	.246
36.5000	.935	.140
41.5000	.935	.132
46.5000	.870	.088
53.5000	.696	.070
58.5000	.609	.053
63.5000	.587	.053
69.0000	.478	.026
73.0000	.283	.018
80.5000	.239	.000
93.0000	.152	.000
101.0000	.000	.000

A cut off score of 46 on the Learning Disability Screening Questionnaire was set as the optimum for discriminating between those with a learning disability and those without. This score allows an accuracy of 87% to identify those without a learning disability and would misclassify 8.8%.

3.2. Part two: Two and four subtest short forms of the WAIS –III that are incorporated in the WASI

3.2.1. Two subtest short form

A direct logistic regression analysis was performed using SPSS version 12.0 on learning disability as outcome, on the basis of two sub test predictors: vocabulary and matrix reasoning. Data was collected from 275 participants.

Table 6 (a) shows the variables in the equation and table 6 (b) shows the model summary.

Table 6 (a). Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 1	MR	.916	.173	28.02	1	.000	2.500
	VO	.949	.162	34.50	1	.000	2.582
	Constan	-	1.356	58.86	1	.000	.000

a. Variable(s) entered on step 1: MR,

Table 6(b). Model Summary

Step	-2 Log likelihoo	Cox & R	Nagelkerk R
1	120.97 ^a	.412	.662

a. Estimation terminated at iteration number 7
parameter estimates changed by less than .001.

The model summary shows that the Naglekerke R Square predicted 66.2% of group membership when using the subtests vocabulary and matrix reasoning.

3.2.2. Four subtest short form

A direct logistic regression analysis was also performed, using SPSS version 12.0, on learning disability as outcome, on the basis four sub test predictors: vocabulary matrix reasoning, block design and similarities. Data was collected from 275 participants. Table 7(a) shows the variables in the equation and table 7 (b) shows the model summary.

Table 7 (a) Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)
Step a 1	BD	1.070	.225	22.55	1	.000	2.915
	VO	.879	.240	13.40	1	.000	2.409
	MR	.769	.223	11.92	1	.001	2.158
	SI	.629	.218	8.355	1	.004	1.875
	Constan	-	3.131	37.71	1	.000	.000

a. Variable(s) entered on step 1: BD, VO,

Table 7(b) Model Summary

Step	-2 Log likelihoo	Cox & R	Nagelkerk R
1	67.58 ^a	.511	.827

a. Estimation terminated at iteration number 9
parameter estimates changed by less than

The model summary shows that the Naglekerke R Square predicted 82.7% of group membership when using the four subtests, block design, vocabulary, matrix reasoning and similarities.

3.3. Part Three: Comparison of short forms and screening tool

3.3.1. Logistic regression for screening tool

A sequential logistic regression analysis was also performed, using SPSS version 12.0, on learning disability as outcome, on the questionnaire's seven item predictors: ability to tell the time, reading, writing, living independently, having a job, previous contact with learning disability services and attendance at special schooling.

The method of sequential logistic regression differs from direct logistic regression in that the direct method, as used with the data from the short forms, places all the covariates into the regression model in one block. The method of sequential logistic regression, however, relies on the researcher to specify the order in which the predictors are put into the model. The first four items were added to the model in this specific order as they are highlighted in the Same as You? (Scottish Executive, 2000) as indicators of learning disability. The remaining three items are found in measures of adaptive functioning.

Data was collected from 160 participants. Table 8 (a) shows the variables in the equation in the order that they were added to the model and table 8 (b) shows the model summary.

Table 8 (a) Variables in the equation

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 1 ^a	INdepLiving	32.10	5268.60	.000	1	.995	8.8E+1
	Job	1.323	1.420	.868	1	.352	3.753
	LDcontact	2.858	1.500	3.629	1	.057	17.42
	Specialed	2.378	1.529	2.420	1	.120	10.78
	TIME	46.12	6912.37	.000	1	.995	1.1E+2
	Read	16.98	3788.67	.000	1	.996	2.4E+0
	Write	-	3788.67	.000	1	.997	.000
	Constan	-	6912.37	.000	1	.994	.000

a. Variable(s) entered on step 1: INdepLiving, Job, LDcontact, Specialed, TIME, Read, Write.

Table 8(b) Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	18.334 ^a	.608	.893

a. Estimation terminated at iteration number 20 because maximum iterations has been reached. Final solution cannot be found.

The model summary shows that the Naglekerke R Square predicted 89.3% of group membership when using the screening tool items.

4. Discussion

The discussion will begin by summarising the results of parts one, two and three of the study. This will be followed by a discussion of the clinical implications of the study, which will examine in detail the implications for clients who are misclassified and the impact that the use of screening tools, such as the one used in the study, has upon clinical psychology services. The methodological implications of the study will then be discussed which will include both the procedural and statistical limitations of this study. This will be followed by a consideration of areas of further research that could be undertaken. Finally, the discussion will end with a conclusion of the study.

4.1. Summary of results

The purpose of this study was to explore the use of two methods of screening in learning disability services. In part one a screening questionnaire that requires information about adaptive functioning was developed and psychometrically evaluated in terms of its ability to identify those with a learning disability. Part two of the study examined which of the subtests of the WAIS III that are included in the WASI, was better at discriminating between those with a learning disability and those without a learning disability. Part three of the study then compared the two screening methods; the short forms and the Learning Disability Screening Questionnaire.

4.1.1. Part One- Learning Disability Screening Questionnaire

The principles of reliability, validity and objectivity need to be met when using newly developed measures (Clark-Carter, 2004). The following discussion will focus on the results of the Learning Disability Screening Questionnaire and show that the screening questionnaire has achieved several measures of validity and reliability.

4.1.2. Inter-rater reliability

It is important that the screening tool has inter rater reliability as this will show that it is sufficiently easy to use and that it can be used by a range of people with minimum training. The results indicate the level of agreement between raters ranges between perfect agreement for some of the variables, including age, gender, VIQ, PIQ, FSIQ and total percentage score on the screening tool, to fair agreement on the learning disability contact variable. The variables that achieved perfect agreement are to be expected as they represent absolute scores, whereas information about previous contact with learning disability services, may have been ambiguous in some of the case notes reviewed. The remaining variables showed good agreement between raters indicating that they were measuring the same construct.

4.1.3. Construct Validity:

Convergent Validity

The screening tool achieved convergent validity, as there was a significant relationship found between the screening tool and the index scores, VIQ, PIQ and

FSIQ, of the WAIS III (Wechsler, 1997). The participant's total percentage score on the screening tool provides an indication of those with a learning disability, in that the lower the total percentage score, the more likely the individual is to have a learning disability.

Discriminative Validity

The main purpose of the study is to examine the screening tools ability to discriminate between those who have a learning disability and those who do not. There are implications for individuals who are misdiagnosed, in that those who have a learning disability and are misdiagnosed will not receive the support they need and those who do not have a learning disability and are misdiagnosed face the stigma of being labelled and do not receive the most appropriate service to meet their needs. Further examination of the impact of misdiagnosis is discussed in the section 'clinical implications of study'.

The results show that the screening tool has achieved discriminative validity as it can discriminate between the groups, learning disability and non learning disability, in respect to the index scores of the WAIS III (Wechsler, 1997). The results show that the screening questionnaire correlates with each of the indices, VIQ, PIQ and FSIQ. The results illustrate that the majority of the participants had an IQ score that falls within the range of significant impairment of intellectual functioning, as mean IQ scores were over 55. This range of scores would appear typical of the intellectual ability of clients were there is ambiguity about the diagnosis of learning disability

and referrals are made to services for assessment. Similarly, in the non learning disability group the index scores fall within the range of borderline intelligence, again reflecting the referral pattern to learning disability psychology services for assessment of intellectual functioning.

These results show that the Learning Disability Screening Questionnaire can discriminate between the two groups referred to the learning disability service in respect of the three diagnostic criteria for learning disability. It correlates with the WAIS-III, the standard measure of intelligence. It includes items relating to adaptive functioning and it picks up on the childhood onset by asking about special education.

The Learning Disability Screening Questionnaire is also able to significantly discriminate between both groups in regard to each of the items, as they correlate with IQ scores. The screening tool was found to have a significant positive correlation between participants' full scale IQ and their total percentage score. This implies that each of the items tap into the areas of adaptive functioning people with a learning disability find difficult. The results would also appear to support the research findings and policy document statements, which suggest that the items of adaptive functioning in the screening tool are found to be difficult for people with a learning disability.

The discriminative ability of the learning disability screening tool is further enhanced with the results of the receiver operating curve (ROC) analysis. The area under the curve, 0.949, indicates that the screening tool is significantly effective at discriminating between those with a learning disability and those who do not have a learning disability. The cut off score was chosen at 46 as it was felt that this score would be the optimal level of correctly discriminating between both groups. In clinical practice this means that those with a score of over 46 would not have a learning disability. The clinical implications of these results will be discussed in detail in a later section.

The results of the logistic regression (table 7b) report the screening tool's ability to predict 89.3% of people with a learning disability. The results show that previous contact with learning disability services is the best predictor of learning disability (table 7b). Presumably, if individuals have established contact with services and have had clinical contact, they will have been diagnosed and are therefore, known to have a learning disability.

The above discussion shows that the Learning Disability Screening Questionnaire was able to discriminate between participants with a learning disability and those who do not have a learning disability. The following section will examine the effectiveness of the two and four parallel subtests of the WASI to discriminate between both groups and discuss the use of short forms in other services.

4.1.4. Part two: The two and four subtest short forms

The results of the use of the two and four subtests that are incorporated in the WASI (Wechsler, 1999) show that the four subtest short form has better predictive ability. It accurately predicts 82.7% of group membership, whereas the two subtest short form accurately predicts 66.2% of group membership.

Two subtest short form

The two subtests used in the WASI are vocabulary and matrix reasoning, the parallel WAIS III subtests used in this study, predict 66.2% of cases correctly (table 5a). The results of the logistic regression show that of the two subtests used, vocabulary is the best predictor of the outcome. Previous research using short forms also confirms that the vocabulary subtest has the highest *g* loading (Nagle & Bell, 1995).

The most commonly used two subtest short form was devised by Silverstein (1982). This short form incorporates one verbal subtest (vocabulary) and one performance subtest (block design). The tests were chosen as they correlated highly with full scale IQ (Silverstein, 1982). This short form has been found to accurately estimate intellectual ability 59-69% of the time (Benedict et al., 1992). It has also been found to be effective for use with vocational rehabilitation patients (Banken & Banken, 1987).

The matrix reasoning subtest, a performance subtest used in the WASI, was a new subtest added to the WAIS- III and did not appear in the WAIS- R (Wechsler, 1997).

Prior to the introduction of this subtest many short forms of the WASI- R utilised the block design subtest as a performance subtest because of its psychometric qualities (Atkinson, 1991; Crawford et al., 1992; Silverstein, 1982). The matrix reasoning subtest has also found to be highly correlated with perceptual organisation (Wechsler, 1999). Ryan and Ward (1999) note that the matrix reasoning subtest takes less time to administer than block design and is less frustrating for examinees, as they can assess their performance.

For people with a learning disability, who have additional physical disabilities, the matrix reasoning subtest has an advantage over the block design subtest, in that the individual is only required to point to the answer they think is correct and unlike block design they do not have to manipulate objects. There is an increased risk of physical disability in people with syndrome-specific disorders; for example, people with Down syndrome are at greater risk of developing musculoskeletal disorders than the general population (WHO, 2001). Likewise, bone demineralisation can occur as a side effect of the extensive use of medications, such as anticonvulsants (WHO, 2001). This type of subtest, therefore, are easier for people with a learning disability to do. For those with poor verbal expressive skills, also a common feature of learning disability, (Bollard, 2002), the matrix reasoning subtest may prove more useful as it doesn't require the examinee to tell the examiner when they are finished.

The two subtest WASI of matrix reasoning and vocabulary are known to have good psychometric properties (Wechsler, 1999). The results of the logistic regression,

however, show that when compared with the four subtest short form the two subtest is, in this study, less effective at predicting learning disability.

4.1.5. Four subtest short form

The WASI four subtest short form uses the subtests vocabulary, similarities, block design and matrix reasoning. These four subtests predict 82.7% of cases in the study correctly. The results of the logistic regression (table 6a) show that block design is the best predictor of the performance subtests, whilst vocabulary remains the best verbal subtest.

Crawford et al. (1992) report that Silverstein's four subtest short form is the best one to use if an estimated full scale IQ is required. This short form comprises of vocabulary, arithmetic, block design and picture arrangement. Nagle and Bell, (1995) advocate the use of all of Kaufman et al.'s "amazingly" short forms with adolescents with a learning disability. These short forms comprise of a dyad, incorporating the subtests, information and picture completion; a triad using information, picture completion and digit span and a tetrad comprising of arithmetic, similarities, picture completion and digit symbol coding. These particular subtests were chosen for their speed of administration as well as their reliability and validity properties. Kaufman et al. (1991) suggest that their "amazingly" short forms maintain the attention and motivation of the examinee.

Despite the concerns of using two subtest short forms for estimating IQ scores, (Axelrod, 2002; Ringe et al., 2002), Nagel and Bell, (1995) report that Kaufman et al.'s dyad provides valid estimates of intellectual functioning. They report that there is only a three-point difference between the dyad and triad and the full intellectual assessment. Three points, however, can make the difference between receiving a diagnosis of learning disability and access to the services needed or being misdiagnosed. The participants in the Nagle and Bell study (1995) were adolescents whose mean full scale IQ was 70.50 (sd= 4.92). Caution, therefore, would need to be exercised if using these subtests with people whose intellectual abilities are more limited. Further discussion of the clinical implications of short forms of intellectual assessments is discussed below.

4.1.6. The clinical implications of the use of short forms of intellectual assessments

Short forms are a quick method of screening intellectual functioning and are advocated for use in services where there are limited resources (BPS, 2003). There are, however, few studies that have examined the use of short forms with people with a learning disability. Of the many shortened forms of the Wechsler scales advocated for use in clinical practice, the WASI was specifically designed for this purpose (Psychological Corporation, 1999) and looked promising for use with people with a learning disability, as it had a set of norms that could be applied to this population group. There are, however, potential problems with the WASI as the sample used for standardisation was small and showed an unusual uniform profile in relation to the

indices. This suggests that it is not representative of the learning disability population in terms of cognitive profile. The current study aimed, therefore, to examine the parallel short forms on the WAIS III. In relation to the two subtest short form it was found that only 66.2% of people with a learning disability were accurately classified. In relation to four subtest short form, the results show that 82.7% of people with a learning disability are accurately classified. Crawford et al. (1992) observe that there is a greater risk of error in estimating the full scale IQ of individual's who are likely to score below the population mean

Stano (2004), however, promotes the use of the WASI praising its 'gold standard' properties and ease of administration. Whereas, Axelrod (2002) advises a cautious approach in the interpretation of the results and reports a significant difference in the index scores between the WASI and the WAIS III. Similarly, Ryan et al. (2005) found that the matrix reasoning subtest on the WASI differed in its ability to show selective sensitivity when compared to the WAIS III subtest in patients with brain injury.

Much of the literature advises caution when interpreting the results of short forms of intellectual assessments in clinical populations, (Axelrod, 2002; DeVinney et al., 1998; Thompson et al., 2004) however, the main purpose of their development was to save time and prioritise limited resources. Nevertheless, Crawford et al. (1992) discourage the use of two subtest short forms and report that there are few situations where its utility would be justified.

Part three of the study also aimed to compare the screening methods of using short forms and the screening questionnaire. This is discussed below.

4.1.7. Part three: A comparison of the Learning Disability Screening Questionnaire and the two and four subtest short forms

This part of the study compared the results of the logistic regression of the two subtest short form, the four subtest short form and the Learning Disability Screening Questionnaire. The results showed that the two subtest short form predicted 66.2% of group membership, whilst the four subtest short form predicted 82.7% of group membership. The Learning Disability Screening Questionnaire, however, predicted 89.3% of group membership. The statistical limitations of these results are discussed in a later section.

With an increased need for the development of screening tools for use in learning disability services, there may become an over reliance on using short forms to quickly assess cognitive functioning. The time factor that is gained in the use of short forms is offset against the rich clinical observations that can be obtained during a full assessment (Aiken, 1996). It remains the consensus of many authors, however, that short forms of intelligence tests should be avoided with people with a learning disability because of the increased margin of error that occurs with this population group (Murray et al., 2003). This study has shown that the Learning Disability Screening Questionnaire is a more effective method of identifying those with a learning disability than the utilisation of short forms of intellectual assessment.

The clinical implications of the use of screening tools will be discussed in detail in the following section.

4.2. Clinical implications of study:

4.2.1. The use of the screening tool in clinical practice

The purpose of the screening tool is not to diagnose learning disability but to identify those who warrant further assessment. The Learning Disability Screening Questionnaire could potentially be utilised by a number of services that need a quick screening method to identify people with a learning disability. An example where the screening tool could prove effective is within the criminal justice system. The police could take advantage of such an assessment in the interview process when they need to make a decision about whether an appropriate adult is required for the individual in question. In this situation there is a need for a quick, reliable method of screening in which a full diagnostic assessment is not immediately required.

Hayes, (2002) reports the use of a screening tool, which has proven effective in the identification of those with a learning disability caught up in the criminal justice system. The utilisation of the Hayes Ability Screening Index (HASI) by the police in New South Wales, Australia, ensures that the rights of the person with a learning disability are maintained. Hayes (2002) further suggests that this type of screening tool could be used in the assessment of consent to medical procedures.

Other screening tools have also proven to be equally as effective within learning disability services. The McDonnell and Hames (2005) screening questionnaire is used for detecting learning disability in parents who are referred to the clinical psychology department for assessment of their cognitive functioning. Bennett, Wood and Hare (2005) used a screening questionnaire to help identify autism in clients with a learning disability.

The screening tools discussed in this study have had an impact upon service development. Hayes, (2002) reports that clients coming through the criminal justice system are identified earlier as a result of her screening tool. This allows for quicker intervention from the appropriate services. Bliss (2002) reports that screening questionnaires, such as the Casemix scale (Pendaries, 1997) has helped to shorten the waiting list in her area, as the additional information gathered at referral can identify those with a learning disability.

The main criticism of the screening tools discussed above is the lack of psychometric data reported with regard to validity and reliability. Some of the screening questionnaires have been carried out with small sample sizes e.g. MacDonnell and Hames (2005) had 17 participants in their study, the study by Bennett et al. (2005) had 30 participants. The present study has shown the Learning Disability Screening Questionnaire to be a potentially valid and reliable way of discriminating between those who have a learning disability and those who do not. Further work, however, may be needed to improve it, for example using it in a clinical setting would provide

further information on its validity. This would highlight any anomalies in the wording of the questions when used by professionals out with the psychology service. This additional data could then be used to assess whether the validity and reliability of the questionnaire would remain in clinical practice.

The screening tools discussed above do not note the implications of misclassification of clients or those who are taken off waiting lists without being assessed first. The following section will discuss the implications of misclassifying clients and discuss the role of the receiver operating characteristics curve (ROC) analysis in the classification of clients.

4.2.2. Implications of the misclassification of clients

The receiver operating characteristics curve (ROC) analysis shows how effective the screening questionnaire is at discriminating between those with a learning disability and those without. It gives a choice of a range of cut –off scores, which help identify the number of ‘cases’ correctly predicted and highlights the potential number of misclassified ‘cases’. ‘Cases’ are defined by the cut-off score on the questionnaire; this gives those who use the questionnaire a definitive score for discriminating between both groups.

In this study the cut of score was set at an optimum level of 46. This means that those who score 46 or less are classified as having a learning disability. Those who

score above 46 do not have a learning disability. This score has the potential to misclassify 8.8% of people with a learning disability. The BPS (2003) notes that although a test can be valid and reliable, it can also have false positives and false negatives. The implications of this for people who have a learning disability who are misclassified is that they could potentially lose out on accessing the services appropriate to meet their needs. These would include loss of access to specialist day activities, financial benefits, legal protection as a vulnerable adult, and additional family support (Kanaya et al., 2003; Scottish Executive, 2000; Suto et al., 2005).

The questionnaire, however, examines the adaptive functioning of people with a learning disability. It is unlikely that a person with a learning disability will be able to fulfil all of the items on the questionnaire without some form of support; that is being able to read, write, tell the time, live independently, have not received special education and have a job. The mere fact that the person can live independently without support to maintain a household or tenancy, or have means of supporting himself or herself, would indicate that they do not have a 'deficit in adaptive functioning', a necessary criteria for the diagnosis of learning disability.

It may prove more likely, that if the screening tool is used in clinical practice, that there is a greater a tendency for false positives. McDonnell and Hames (2005) observe that in these cases the individual may experience feelings of stigma at being diagnosed as having a learning disability. It is possible that those individuals identified as having a learning disability may be the ones who come into the

borderline range of intelligence and require additional support, as reflected in the referral pattern in this study. It would be preferable to pick up false positives than false negatives. These cases would be easier to identify, as the purpose of the screening tool is to highlight those who warrant further assessment. Misdiagnosis in these circumstances is easier to rectify, as this would be picked up in the assessment process, therefore, the individual would not have to spend too long in the service and stigma is less likely to occur as a result.

The screening tool is not designed to replace intellectual assessment or assessments of adaptive functioning and if an individual is admitted to learning disability services on the basis of the screening questionnaire, further assessment will highlight this. Likewise, if the responses on the screening questionnaire appear ambiguous then this would warrant a more in-depth assessment interview with the client in question. It is, therefore, important that the questionnaire is utilised in the right way and is not perceived to be a diagnostic tool for other professionals to use. As well as the implications for the clients referred to the service, there are also implications for the psychology service. This will be discussed in the following section.

4.2.3. Implications for psychology service

The development of screening tools has implications for clinical psychologists working in learning disability services. Clinical psychologists have traditionally played a key role in the diagnosis of learning disability, as only qualified psychologists, or those supervised by qualified psychologists, can administer

cognitive assessments, which form a key part of the diagnosis. Screening tools, which can be used by non-psychologists, introduce the possibility of both advantages and disadvantages for psychologists. Some of these will be discussed below.

In terms of disadvantages there is a concern that, if the screening tool is used by other professionals it could be viewed as a replacement for cognitive assessments and used as a diagnostic tool, particularly in those services where there is a limited amount of clinical psychology time.

Another disadvantage of the screening questionnaire is the potential difficulty of uninformed staff working out with their professional remit. Role and boundary issues are frequently highlighted in nursing literature. Leonard, (1999) notes that only 66% of the nurses in her study had a clear understanding of their role. A possible reason given for this is that the nursing professional body, the United Kingdom Central Council for Nursing and Midwifery, (UKCC, 1999), stated that certification of competence limited the extended role of the nurse and was, therefore, not required. The emphasis was placed upon the nurse taking responsibility for their knowledge and skills.

Leonard (1999) argues that the lack of clear direction from the professional body with regard to nurses achieving certification of competence, has led some nurses to work out with their role remit and neglect their own roles. Similar themes emerge from other studies of nurses undertaking extended roles with opposition expressed by

other professionals and fear of litigation by the nurses themselves (Tye & Ross, 2000). Ironically, when asked about training care attendants to extend their role, many nurses expressed concern about role ambiguity and were worried that attendants would undermine the nurses role by overstepping their role into the domain of nursing staff (Coffey, 2004).

Within learning disability services, professional roles and responsibilities may overlap, for example, nursing, psychiatry, speech and language therapy and psychology may all be involved in the management of challenging behaviour (McKenzie et al., 2000b). This may at times, lead to professionals working outwith their remit or undertaking roles for which they have not been trained. A number of studies report that some professional and non-professional staff working in learning disability services, may lack some basic knowledge required to do their job (McKenzie et al. 1999). Similarly, Smith et al. (1996) found that a number of staff working with people with a learning disability had not had adequate training and staff themselves have reported that they felt their training was inadequate to do their job (McVilly, 1997). This highlights a need, therefore, for adequate training and advice to be given to the team members and other professionals within learning disability services in regard to the purpose of the screening tool, how to administer and interpret it and the implications for clients if it is used as a diagnostic tool.

There is also a danger that because each item can discriminate between both groups, staff may take this as an indication to use individual items to assess group

membership. Requiring support or having literacy problems are not exclusive to the learning disability population. This further emphasises the need to ensure that staff fully understand the purpose of the screening questionnaire, whilst highlighting that using the items individually could result in an increase in the misclassification of individuals.

The advantages of the use of screening tools are that they can be used to help ease the workload of busy clinicians (McDonnell & Hames, 2005). One of the factors that contribute to the workload of clinical psychologists in learning disability services can be the limited number of clinical psychologists working in the specialty. It is recommended by the clinical psychology workforce planning group (BPS, 2001) that there should be a minimum of four whole time equivalent clinical psychologists per 250,000 of the general population, to specifically work with people with a learning disability. With a further recommendation that a B grade psychologist heads the service.

A study by McKenzie et al. (2000b) surveyed community learning disability teams in Scotland and found that clinical psychology was under resourced in respect of the recommended figures. Similar findings have been reported in other studies examining psychology services for people with a learning disability (Bliss, 2002). Rose et al. (2001) carried out a UK wide survey of clinical psychology services and observe that few psychology departments have the recommended amount of psychologists. They also highlight a diversity of service provision between

departments with some offering services to people with profound learning disability and others only offering services to those with severe and moderate learning disability. One of the reasons given for this diversity is the lack of manpower to meet the needs of referrers.

A result of the lack of manpower in clinical psychology services has prompted a proposal for changing the criteria of learning disability in order to ensure that those who need the services most get them. There is concern of an over reliance on the arbitrary use of the IQ score of 70 being a defining criterion of learning disability (Whitaker, 2004). Burton (1997) has suggested doing away with the term learning disability and argues that labels only stigmatise people. He suggests that people should receive services if they require them but acknowledges that current services would be unable to cope with the demand should this happen.

Similarly, Whitaker (2004) has suggested changing the definition and terminology of learning disability to include 'intellectual disability' which would take in those who fall in the borderline range of intelligence. He argues that there is little difference between those with an IQ below 70 and those in this borderline range in their ability to cope with everyday life. He further adds that the standard error in the WAIS III indicates that those with an IQ of below 70 are not being correctly identified. Whitaker (2004) suggests that people with an IQ above 70 who have difficulties in adaptive functioning could be classified as being 'environmentally challenged' and this, therefore, would allow them access to the services they are currently being

denied. These suggestions, however, do not solve the problem of limited resources for people who need specialist support, regardless of how they are diagnosed, as support still needs to be found.

The use of screening tools, however, could provide a means of freeing up clinical psychology time to allow for other aspects of service provision, such as more therapeutic work, to be undertaken. The Learning Disability Screening Questionnaire, developed in the present study, could prove effective in allowing this to happen. Other services, which have used screening tools at the point of referral, report that referrals are dealt with quicker, which frees up the psychologist's time to work with those people who need them (Bliss, 2002; Hayes, 2002).

Once the learning disability team have been instructed on its use, the questionnaire could be utilised by other professionals such as GP's and primary care staff. The 'Same as You?' document (Scottish Executive, 2000) encourages people with a learning disability to access ordinary services as much as possible. As primary care is often the first port of call for people requesting help, it would appear to be an obvious situation in which to use the screening questionnaire. The difficulty with this, however, is that it may prevent people accessing learning disability services or being referred for specialist input. There may be a case, therefore, in limiting the use of the questionnaire to the learning disability service only.

The 'Same as You', (Scottish Executive, 2000) recommends that people who need help should get it and are currently in the process of employing Local Area Coordinators (LAC) within every local authority region in Scotland. The LAC is a publicly funded service whose purpose is to enhance existing services by working with people in their homes and community and like every other publicly funded service there is limited public funding. There is, therefore, a danger that those who need the service the most may not get it if there is to be no consideration of the individual's intellectual functioning when accessing learning disability services.

Similar proposals for change are being discussed in the services for people with learning difficulties in the USA. It is proposed that the classification model for what America terms learning disability, is changed to developmental learning delay (Bombrowski, 2004).

As discussed above screening tools have proven useful in clinical psychology services. There needs to be, however, careful consideration of the disadvantages of screening tools, such as team members using them as diagnostic measures and working out with their role remit. It is important, therefore, that the staff using screening tools have a clear understanding of their purpose. Team members also need to be able to recognise the limitations of the use of screening tools. Training team members to use screening tools appropriately could help overcome these difficulties.

Despite the current proposals for change in learning disability services, there remains a need to ensure that the people who need the services the most receive them. Those who currently fall out with the learning disability range in respect of the current definition are usually referred to adult mental health services to have their psychological needs met or the local authority social work department should they require additional support. The use of a screening tool such as the Learning Disability Screening Questionnaire could help to ensure that services are provided quickly to those who need them. There are, however, some methodological limitations that need to be considered in the use of this screening tool. The following section will discuss these in detail.

4.3. Methodological limitations

There were a number of methodological limitations found in the study.

4.3.1. Validity and reliability:

Inter- rater reliability

Any measure developed for clinical use has to be reliable and valid. The raters in this study were psychologists and significant agreement was found on all of the items. Inter- rater reliability was not carried out between members of the community learning disability team or other professionals who may use the screening tool, such as social care staff, GP's or the police. It is not, therefore, known if the screening tool achieves inter- rater reliability under these conditions.

Test-retest reliability

This was not examined as the data was collected from anonymised case files. It was, therefore, not possible to measure the test-retest reliability of the screening questionnaire. If the questionnaire were to be used in clinical practice, this would be an important test of the reliability of the tool by examining if the individual being assessed achieved the same score on two separate occasions.

Alternate forms

Some of the items used in the questionnaire were representative of the difficulties faced in activities of daily living with people with a learning disability, for example, difficulty with telling the time and reading and writing (Harrison & Oakland, 2003; Sharp et al., 2001). Adaptive functioning covers a broad area of life skills and therefore, it may be that any area of adaptive skill could have been used in the questionnaire and achieved the same results. Likewise, a parallel form of the screening tool may have proved to be more valid.

4.3.2. Discriminative validity

ROC analysis

A cut off score of 46 for the ROC analysis on the Learning Disability Screening Questionnaire was chosen as it accurately identified 87% of those without a learning disability and would misclassify 8.8%. As previously discussed, cases of false positives and false negatives occur even in the most valid and reliable tests (BPS, 2003). This score, therefore, was chosen as it was felt that this was the optimum

score for sensitivity and specificity. It should be noted, however, that other cut off scores could have been used. A cut off score of 41 would have correctly identified 93% of those who did not have a learning disability but would misclassify 13%. Likewise, a higher cut off score of 53 would have correctly classified 69% of those who did not have a learning disability and would only have misclassified 7%. It is difficult to assess whether the cut off score will have any impact upon clients and services until the learning disability screening questionnaire is used in clinical practice.

Content validity

Content validity measures the extent of which the full variety of behaviours is being measured is included in the screening tool (Clark-Carter, 2004). While the items used in the present study were chosen on the basis of the known difficulties that people with a learning disability have, (Sparrow, et al. 1984; Scottish Executive, 2000), other adaptive functioning questions could have been chosen for the questionnaire. This could have been done by asking professionals working within learning disability services, what items they would have considered for use in a questionnaire, to identify the deficits in adaptive functioning faced by individuals with a learning disability. The items chosen in the questionnaire, however, were guided by current policy documents and research, which would indicate achievement of content validity.

4.3.3. Scoring Criteria for learning disability screening questionnaire

Participants were excluded from the study if there was missing data for 3 or more items areas in the screening tool. There were, however, some participants who had missing data for 2 areas and it is therefore, unknown if this would have significantly impacted upon the results.

4.3.4. Standardisation

The learning disability screening tool was developed for use with the learning disability clinical population and therefore, the results were based on this population. It should be noted that the results may not apply to wider group of people with learning disability i.e. those not referred to learning disability services or clinical psychology services. The study was limited to a specific geographical area and therefore, results may not generalise to other areas. It should be noted, however, that the referrals to the service in question are similar in nature to other studies that have been undertaken (Murray, & McKenzie, 1999b; McKenzie et al., 2000a).

4.3.5. Social Validity

Social validity involves examining the areas of relevance to the group it is being applied to (Stanley & Roy, 1988). With regard to social validity, although the learning disability screening questionnaire achieved social validity in respect of it being developed from research and policy guidelines, there was no consultation with people with a learning disability about the item content. It would have been

appropriate to consult with a group of people with a learning disability and ask them how their learning disability impacts upon them. Had this been done it may have changed the item content of the questionnaire to reflect the typical difficulties in adaptive functioning faced by people with a learning disability.

4.3.6. Short forms of the WAIS

Standardisation of the short forms

As with the screening tool, there are similar difficulties encountered in the generalisation of the results with the learning disability population. The results are taken from a study of people with a learning disability who have accessed clinical psychology services who, therefore, may not be representative of the wider population of people with a learning disability. The same applies to the geographical area included in the study.

The results were limited to those who were able to complete a WAIS-III assessment; therefore, they may not be valid for those with profound learning disability or those who could not complete for other reasons e.g. limited verbal communication or physical disabilities.

4.3.7. Procedural limitations

There were also a number of procedural limitations in this study. The study used the WAIS-III subtests to parallel the WASI, however, some of the items in the subtests

of the WASI differ from the items in the parallel subtests of the WAIS-III. There were also a number of alternate ways in which the data could have been collected and analysed. The study could have been carried out using the WASI with people with a learning disability. The WASI, however, has a number of flaws when applied to people with a learning disability as outlined in the introduction. The population sample used in the standardisation of this group is much smaller than the population sample used in the WAIS-III and indeed in this study. The small population sample of the WASI impacts upon the validity of the results and would, therefore, not be an effective method to discriminate between those with a learning disability and those without.

The study could have been carried out using the WASI and correlating the scores with the full scale IQ on the WAIS-III. This method would, however, have proved difficult as two separate data sets were collected; information relating to the questions on the screening tool and participants WAIS-III subtest scores. As both data sets were anonymised they could not be matched. The data was collected from an existing database i.e. client case files, which meant that there was only data available in regard to WAIS-III scores. Clients, therefore, would not have undertaken a WAIS-III and a WASI, and although this could have been done, it would not have been without its problems. It would be time consuming and clients may have experienced tiredness undertaking both assessments. The very nature of learning disability would indicate that clients might experience attention difficulties, which

would impact upon the results. There is also the practice effect factor that would need to be considered.

It was also a possibility to prorate the sub test short forms to produce a full scale IQ but this also has difficulties. The two subtest short form of the WAIS-III also contributes to the 4 subtest short form and all of the subtests contribute to the full scale IQ, therefore, contribution could not be parcelled out. As the study was exploring the use of short forms in terms of their discriminative ability of learning disability, other factors need to be considered in the diagnosis of learning disability.

There are also potential problems with the reliability of the WAIS-III results, in that WAIS-III scores can be effected by tester error. McKenzie et al. (2004) note that clinical psychologists frequently change the wording of instructions to people with a learning disability. Slate et al. (1991) report that changing the instruction wording in this way impacts upon the individual's scores. The assessments, which contributed to the data in this study, were carried out by a limited number of psychologists. This will have reduced the possibility for errors in that any errors in the administration of the WAIS-III would presumably be fairly consistent.

4.3.8. Statistical limitations

The study shows that there were unequal group numbers in both parts of the study in that there were more participants in the learning disability groups. This, however, is

reflective of the referrals to a community learning disability service, in that many more people with a learning disability will be referred than those who do not have a learning disability.

When examining the discriminative ability of the learning disability screening questionnaire against the WAIS-III index scores, the data relating to the variables, FSIQ, PIQ, VIQ and percentage total was shown to be skewed. The requirements for the use of parametric tests in these circumstances have not been met and some authors would suggest that non – parametric tests should be used (Bradley, 1968). It is argued, however, that parametric tests are sufficiently robust enough to be used in these circumstances, particularly with a large sample size, in this study, $n = 275$ (Clark-Carter, 1997, Howell, 1997; Cramer, 1998). Green and D'Oliveira (1999) report that unless the data is very divergent parametric tests can still be used.

The results also show 4 outliers in the non learning disability group for full scale IQ, 3 outliers in this group for verbal IQ and 3 for performance IQ. It is usually recommended that outliers are eliminated from the data (Kinnear & Gray, 2000), however, Burke (2005), argues that outliers should not be eliminated on statistical grounds only. The extreme scores represent those individual's who are mistakenly thought to have a learning disability and are therefore, referred to the learning disability service.

In this study the measure of kurtosis was not significant. The type of referrals requesting assessment for a diagnosis of learning disability could account for the data

being skewed. The data in this study regarding the intellectual functioning of participants fell within the range of learning disability and borderline intellectual functioning. It is to be expected that people referred to learning disability services would either fall within the range of learning disability with regard to intellectual ability, or fall within the borderline or low average range of intelligence. Community learning disability services would not expect to receive referrals from people of normal intelligence.

4.4. Areas for future research

The most obvious area of future research would be studying the use of Learning Disability Screening Questionnaire in clinical practice. As previously mentioned, the questionnaire could be utilised by services that refer to learning disability teams. In particular those who do not have regular access to or an awareness of the existence of the learning disability service, such as the police and the criminal justice service.

The use of the screening questionnaire in this way could examine whether there are any amendments required to the questionnaire such as rewording the questions or providing additional information with regard to the operational definitions of some of the questions.

A further study could explore the impact that the screening tool has on the learning disability team in relation to referral rate and number of cases admitted to the services. A study could also be undertaken on the impact on the workload and role of the psychologist working in learning disability services, in particular to explore if the

use of the questionnaire has effected the role of the psychologist within the team. It would be interesting to find out if the use of the screening questionnaire reduces the number of intellectual assessments carried out with those who do not meet the criteria for learning disability.

If this study were to be repeated it would be recommended that in the process of data collection, that the information pertaining to the screening questionnaire and the short forms of the WAIS-III were collected on the same database. This would allow for additional data analyses to be carried out such as a logistic regression that could explore which of the factors would be the best predictor of learning disability.

4.5. Conclusion

This study has focussed on the social construct of learning disability and how changes to the definition and service provision have changed as a result of social and political change. It would appear, however, that although there have been many changes; some things remain relatively stable over time. The definition of learning disability and the criteria for diagnosis have changed very little since the 13th Century. The concept of assessing an individual's intellectual functioning and adaptive abilities remain a major factor in the learning disability field.

There also remain criticisms in the manner of which these assessments are carried out. The difficulties with IQ drift, and lack of uniformity in the results of intellectual

assessments with this population group have led to a demand for more effective ways of assessing. Similarly, assessments of adaptive functioning also have their problems, with outdated norms and informant bias. There is a general consensus that these methods are not effective enough when they are needed to make life changing decisions for people with a learning disability. There is, therefore, demand for change to ensure that everyone who needs a service receives one and services are beginning to change again as a result of social and political pressure.

Within limited clinical psychology services there is also a need to ensure services are delivered quickly to clients, therefore, there has been an interest in screening tools as a means of prioritising services. This study has explored the use of two such means of screening; short forms of intellectual assessments and a questionnaire focussing on adaptive functioning. The study has shown that the screening questionnaire achieved several measures of reliability and validity but has yet to be used in clinical practice.

The learning disability screening questionnaire can be used by non-psychologists, in particular other members of the community learning disability team. The use of this screening tool would allow for learning disability services and more so, psychologists who work in these services, to allocate resources and time to those who are identified as having a learning disability. Those who do not fall into the learning disability category could be re-referred to more appropriate services, thus saving time for both the individual and the service. It would be anticipated that the learning disability team members would score the screening questionnaire following

training in its use by the psychologist in the team. There remain, however, concerns that the screening tool may become relied upon as a diagnostic measure, when its purpose is to screen. Careful monitoring of the use of the screening questionnaire would therefore have to be carried out by the clinical psychologist. Further research is needed in examining its use in clinical practice and to make any amendments that may arise as a result of this.

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6. Appendices

6.1. Learning Disability Screening Questionnaire

SCREENING QUESTIONNAIRE

Date Completed:

Client Information

Name of Client:

D.O.B:

Gender:

Results of Previous Assessments (if applicable):

Date of Assessment:

Full Scale IQ: Verbal IQ: Performance IQ:

Respondent Information:

Name:

Relationship to client:

Screening Information:	Yes	No	Don't Know	Score
1. Can the client tell the time?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Can the client read?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Can the client write?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Does the client live independently?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. Does the client have a job?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. Has the client had previous contact with learning disability services?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. Has the client had special schooling?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Scored items (7-number of items answered 'don't know')

Percentage score (number of items scored 'yes'
divided by scored items X 100)

Definitions & Scoring

To calculate the total score, add up the number of items answered yes or no (ignore those answered don't know). Add up the items answered 'yes', divide by the total score and multiply by 100 to give a percentage score.

1. Tell the time to within 5 minutes on an analogue watch/clock
Yes = 1 No = 0
2. Read a paragraph from a newspaper or magazine
Yes = 1 No = 0
3. Write words forming sentences (not copying)
Yes = 1 No = 0
4. Lives either:
 - by self, without support
 - with a partner or friend
 - with family, but is not dependent on them for supportYes = 1 No = 0
5. In current/previous employment, held for a period of time
(Not voluntary/sheltered/charity work)
Yes = 1 No = 0
6. Evidence of contact with any part of learning disabilities team at any time
(except for assessment to determine if has a learning disability)
Yes = 0 No = 1
7. Attended a special school, or had learning support involvement
(Not mainstream schooling)
Yes = 0 No = 1

6.2. (A & B) Communication regarding ethical agreement

Donald, Rosemary

From: Cameron, Ross
Sent: 09 June 2004 16:54
To: Donald, Rosemary
Subject: RE: Pre-assessment screening tool

Thank you Sarah

The basic principles of confidentiality and consent are that the minimum info is used for a proper purpose by the proper people. Since the purpose of this is to develop a screening tool, you have a legitimate reason for accessing the info and since no identifiable info will leave the record (only anonymous aggregated "factors") I have no problem with this work going ahead.

If you were to use particular patients info in any potentially identifiable way, then you would need consent but I assume that will not be the case.

Best wishes for the work

Ross Cameron

-----Original Message-----

From: Donald, Rosemary
Sent: 09 June 2004 16:28
To: Cameron, Ross
Subject: Pre-assessment screening tool

Dear Dr Cameron,

Hi. I'm one of the new psychology assistants working for the learning disabilities team at psychological services, in Gala. Karen McKenzie has asked for me to contact you regarding developing a screening tool to use prior to intellectual assessment. Since a large proportion of the referrals made to us turn out not to have a learning disability unnecessary assessments can be very time consuming. Issues for pre-assessment might include for example; telling the time, adaptive skills, if they have a job, previous contact with community learning disability services, and special schooling. This would therefore require looking back over the relevant child/educational notes of the closed files that we keep, to find factors which indicate that a person does not have a learning disability. We are looking for your permission to do this as Deborah Adams suggested this route with yourself, rather than the research route.

Many thanks,
Sarah Miller
Psychology Assistant

Subj: **Thesis project**
Date: 25/05/2005 09:20:48 GMT Standard Time
From: ross.cameron@borders.scot.nhs.uk
To: donnapax@aol.com

Donna

Further to our conversation yesterday regarding the use of previously gathered anonymised data for use in your thesis, I am happy to confirm, following a brief discussion with Dr A Riley (DPH & Caldicott Guardian), that I have no objections to you using the data as you described.

Best Wishes

Ross Cameron
Medical Director

This email and any files transmitted with it are confidential and intended solely for the use of the individual or entity to whom they are addressed.

Opinions expressed herein are those of the sender and do NOT represent the corporate position of NHS Borders

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This footnote also confirms that this email message has been swept by MIMESweeper for the presence of computer viruses.

www.mimesweeper.com

Subj: **Re: Thesis project**
Date: 01/06/2005
To: ross.cameron@borders.scot.nhs.uk

Dear Dr. Cameron

Further to our recent conversation and your email, thank you for confirming that it is acceptable to use the data for the purposes of writing up my thesis and disseminating the results in publications.

Donna Paxton
Trainee Clinical Psychologist

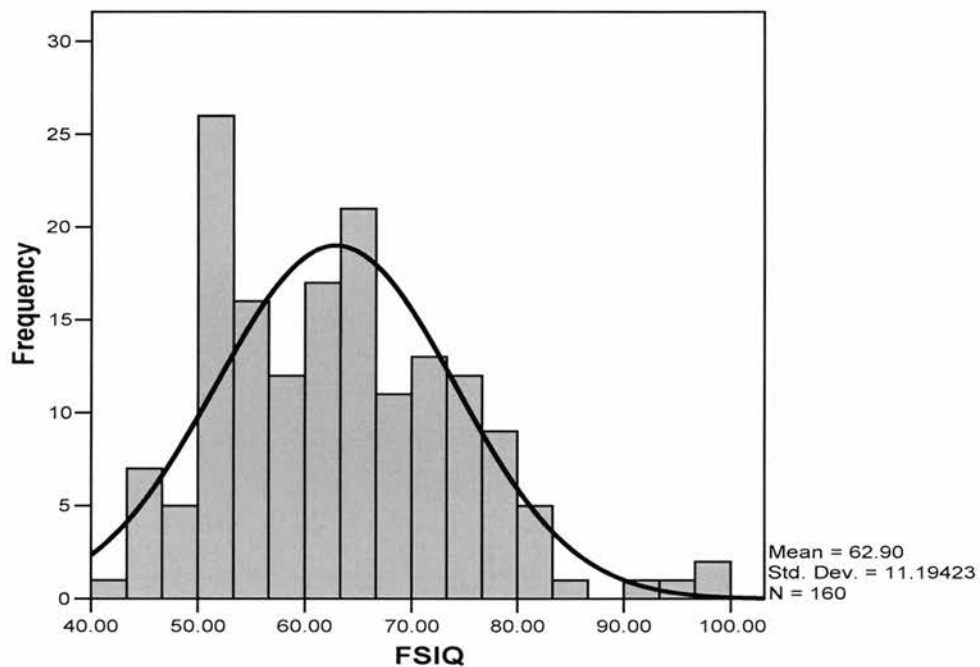
6.3. Histograms and Box Plots

Appendix 3:

Histograms and box plots relating to the variables, FSIQ, PIQ, VIQ and percentage total.

The following histograms and box plots indicate the number of outliers and report the extent of skewdness for each variable.

Figure 1. Histogram for Full Scale IQ



The histogram in figure 1. reports a positively skewed distribution for full scale IQ.

The following table (table A1.1) indicates the level of skewdness and kurtosis for the variable, full scale IQ.

Table A1. 1 Results of skewdness and kurtosis for full scale IQ

N	Valid	160
	Missing	0
Mean		62.9000
Median		62.5000
Std. Deviation		11.19423
Skewness		.600
Std. Error of Skewness		.192
Kurtosis		.303
Std. Error of Kurtosis		.381
Minimum		42.00
Maximum		100.00
Percentiles	25	54.0000
	50	62.5000
	75	70.7500
	90	77.0000

The measure of kurtosis is not statistically significant (table A1.1). The following box plot (figure 2.) shows where the outliers are situated in the full scale IQ variable.

Figure 2. Box plot of full scale IQ categorized by learning disability

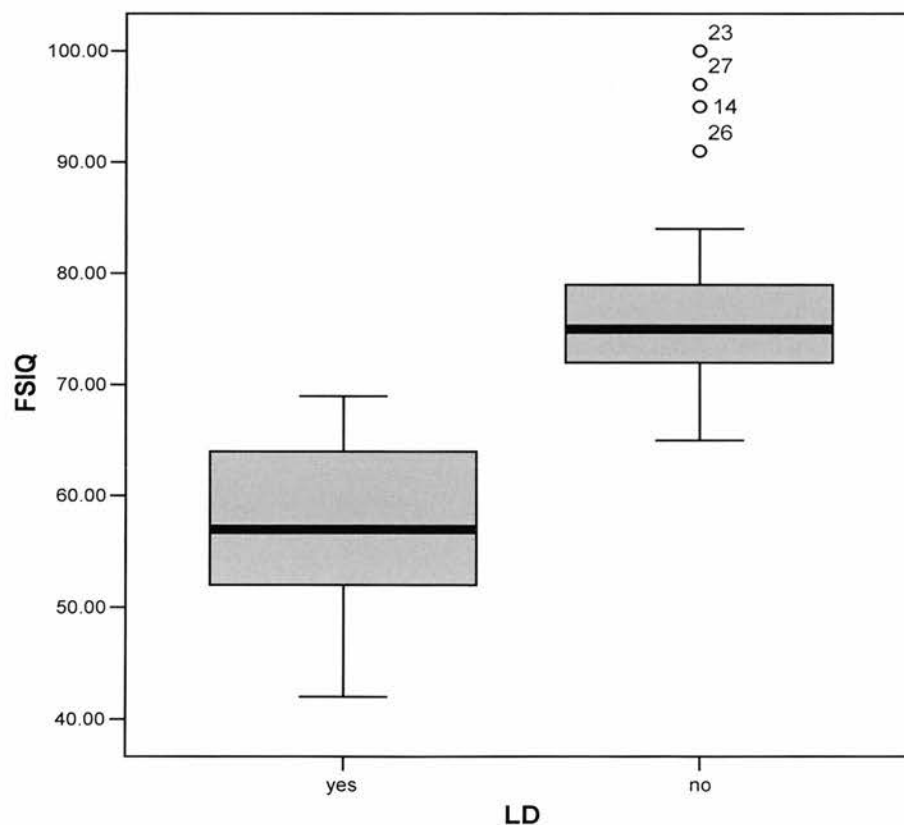
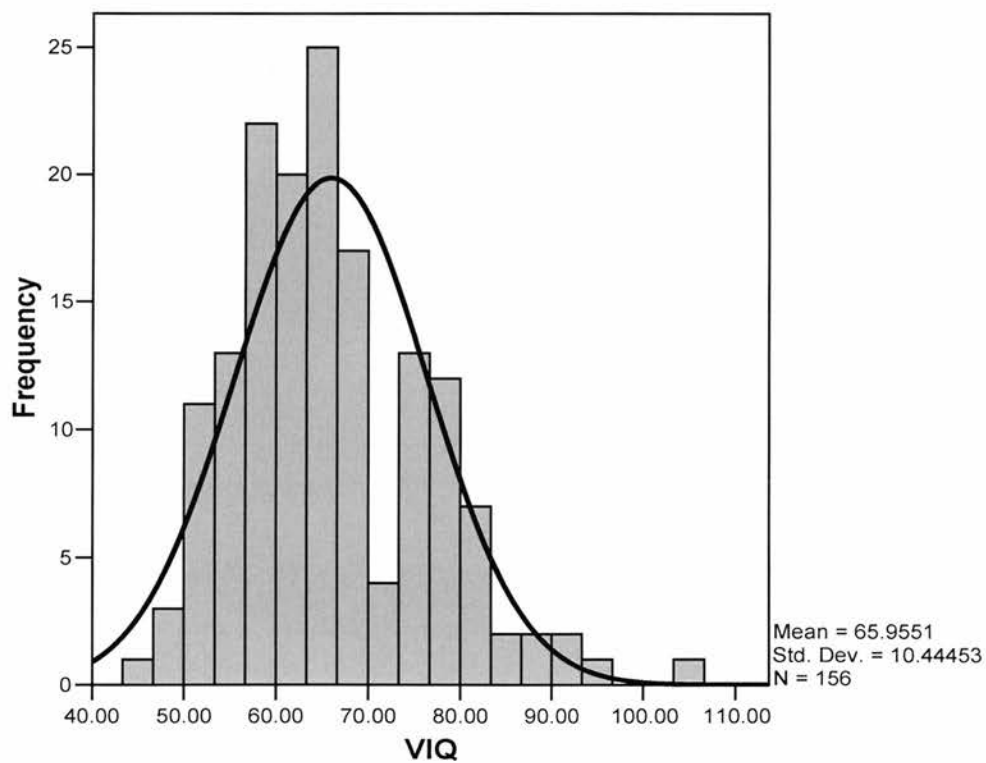


Figure 2. above shows that of the 160 participants, there were 4 outliers in the non learning disability group.

The following histogram (figure 3.) shows the variable verbal IQ to be positively skewed.

Figure.3 Histogram for verbal IQ



The histogram in figure 3. reports a positively skewed distribution for verbal IQ.

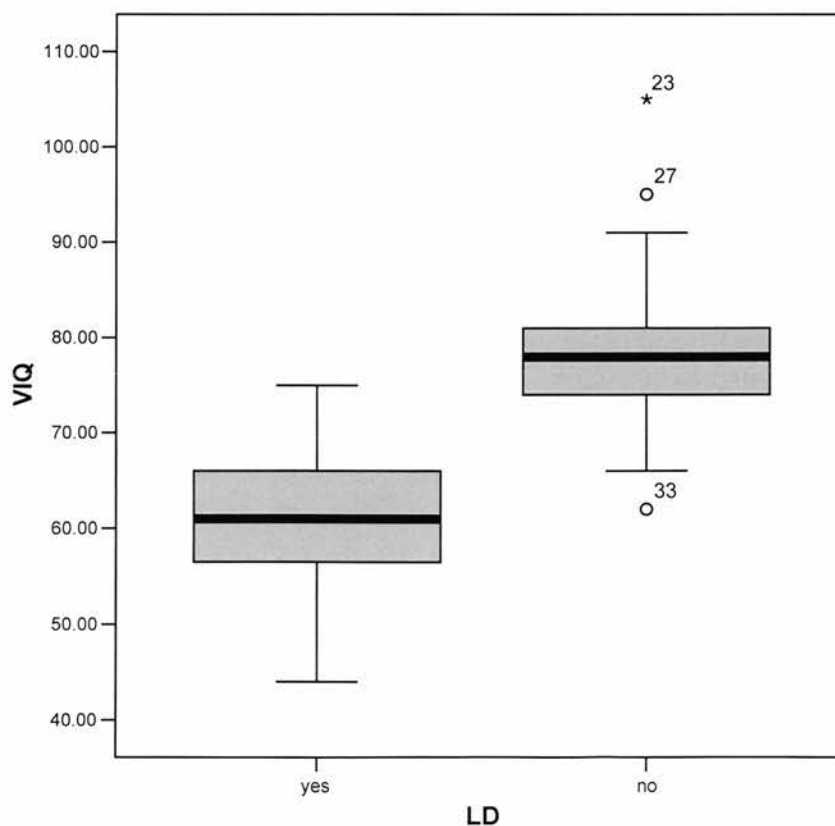
The following table (table A1.2) indicates the level of skewdness and kurtosis for the variable, verbal IQ.

Table A1.2 Results of skewdness and kurtosis for verbal IQ

N	Valid	156
	Missing	4
Mean		65.9551
Median		65.0000
Std. Deviation		10.44453
Skewness		.729
Std. Error of Skewness		.194
Kurtosis		.668
Std. Error of Kurtosis		.386
Minimum		44.00
Maximum		105.00
Percentiles	25	59.0000
	50	65.0000
	75	74.0000
	90	80.3000

The measure of kurtosis is not statistically significant (table A1.2). The following box plot (figure 4) shows where the outliers are situated in the verbal IQ variable.

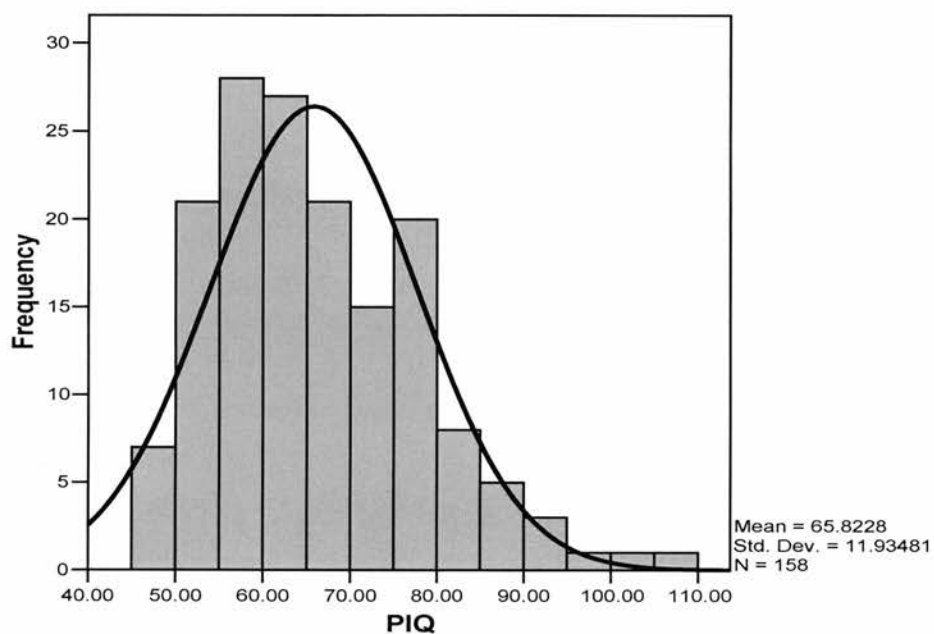
Figure 4. Box plot of verbal IQ categorized by learning disability



The box plot (figure 4.) shows that of the 156 participants, there were 3 outliers in the non learning disability group.

The following histogram (figure 5.) shows the variable performance IQ to be positively skewed.

Figure 5. Histogram for performance IQ.



The histogram in figure 5. reports a positively skewed distribution for performance IQ.

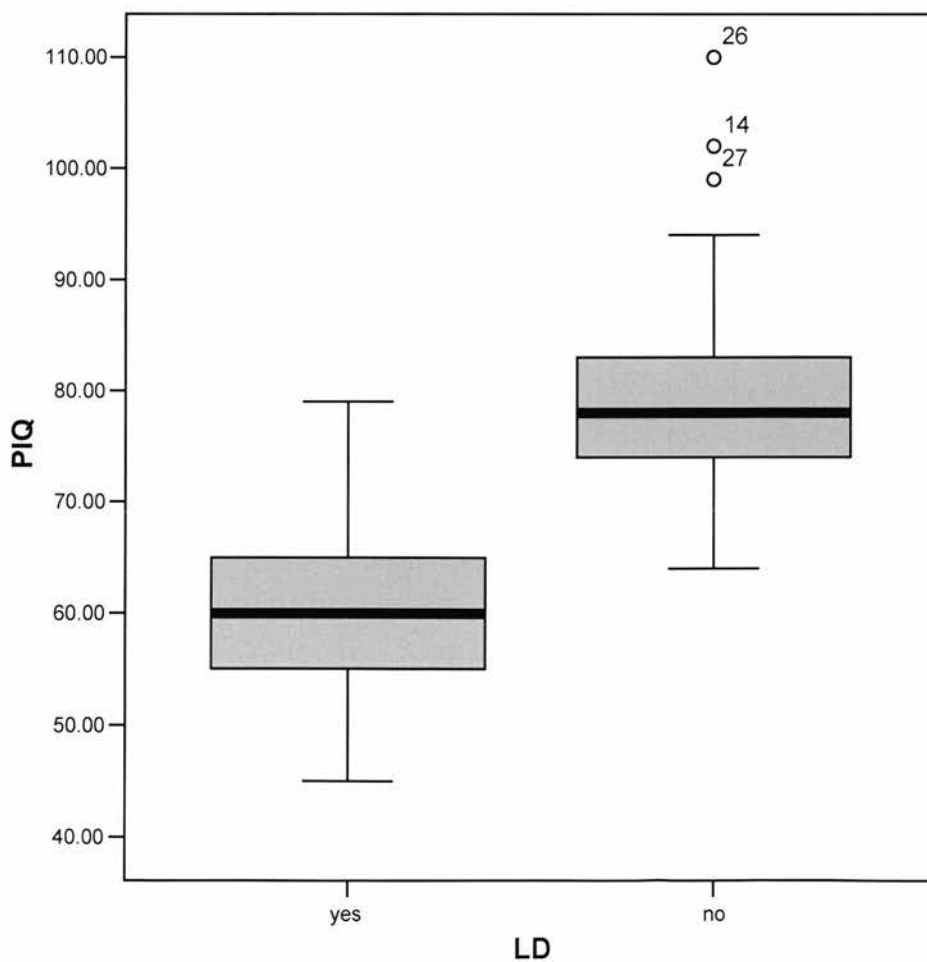
Table A1.3. highlights the level of skewdness and kurtosis for the performance IQ variable.

Table A1.3 Results of skewdness and kurtosis for performance IQ

N	Valid	158
	Missing	2
Mean		65.8228
Median		64.0000
Std. Deviation		11.93481
Skewness		.792
Std. Error of Skewness		.193
Kurtosis		.737
Std. Error of Kurtosis		.384
Minimum		45.00
Maximum		110.00
Percentiles	25	57.0000
	50	64.0000
	75	74.2500
	90	80.1000

The measure of kurtosis is not statistically significant (table A1.3). The following box plot (figure 6.) shows where the outliers are situated in the performance IQ variable.

Figure 6. Boxplot of performance IQ categorized by learning disability



The box plot shows that of the 158 participants, there were 3 outliers in the non learning disability group.